

ICRI EAST ASIA REGIONAL STRATEGY ON MPA NETWORKS 2010

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I. Background

International Coral Reef Initiative and East Asia

The International Coral Reef Initiative (ICRI) is a unique public-private partnership that brings together governments, international organizations, scientific entities and non-governmental organizations committed to reversing the global degradation of coral reefs and related ecosystems, such as mangrove forests and seagrass meadows, by promoting the conservation and sustainable use of these resources for future generations.

The ICRI approach is to provide a platform for information sharing, and to mobilize governments and a wide range of other stakeholders in an effort to improve management practices, increase capacity and political support, and share information on the health of these fragile ecosystems. ICRI's First International Workshop held in Dumaguete City, Philippines in 1995 recommended that all regions of the world meet to prepare specific action agendas based on specific circumstances in each region. From this recommendation, between 1995 and 1997, several intensive regional workshops were held throughout the world. ICRI also encouraged regional stakeholders to attend these regional workshops regardless of their membership status, and provided an important platform where a wide range of regional stakeholders could meet and address regional issues beyond their local positions.

This regional focus, however, gradually faded and the form of the meetings evolved to the Coordination and Planning Committee (CPC) meetings as the advisory committee of the ICRI Secretariat, and to the General Meetings which are held once or twice annually and convened by participants from all over the world.

This trend was also apparent in the East Asia region where the First Regional Workshop was held in Bali, Indonesia in 1996, followed by the Second Regional Workshop held in Okinawa, Japan in 1997 and the Third Regional Workshop held in Cebu, Philippines in 2001. There was however limited continuity of the discussion and policies developed after these workshops

Coral Reefs and Related Ecosystems in East Asia

The East Asia region is recognized as the global center of diversity for the flora and fauna of coral reefs and related ecosystems, making the conservation of the area's marine biodiversity a matter of global significance.

The region also supports diverse cultures, races, languages, and a population of more than 557 million where 60% live within 60 km of the coast (Population Reference Bureau, www.prb.org). There is also a long history of people living together, using and depending on the ocean, particularly in coastal areas, through trade, food consumption, and as part of various cultural activities.

Thus, the conservation and sustainable use of coral reefs and related ecosystems in the East Asia region and the biodiversity they support is of indisputable social, economic and ecological significance. These diverse and productive ecosystems support important commercial and subsistence fisheries, providing critical sources of food

and income for local communities. Tourism activities associated with coral reefs and related ecosystems are important sources of employment and foreign currency income. These inter-related ecosystems are also the feeding, spawning, nursery and recruitment grounds of many marine species that migrate or are transported by currents and other forces across the region.

Unfortunately, the marine habitats of the region are increasingly under pressure from land- and sea-based human activities and off-site sources of pollution which, together with overexploitation and physical damage, are resulting in the degradation and destruction of coral reefs and related ecosystems. Moreover, these highly diverse but vulnerable ecosystems are facing recent, unprecedented threats through the periodic mass bleaching of corals caused by increased sea temperatures and ocean acidification. The social, economic and ecological consequences of this are severe, especially for the local communities that depend on them and for developing countries of the region.

MPA networks as the strategy to conserve coral reefs and related ecosystems in East Asia

Marine Protected Areas (MPAs) are recognized internationally as one of the most effective tools to conserve and manage marine and coastal ecosystems and resources. The Johannesburg Plan of Implementation adopted at the 2002 World Summit on Sustainable Development (WSSD) focused attention on MPAs by calling on nations to establish representative networks of MPAs by 2012. The Convention on Biological Diversity (CBD) responded to this recommendation and the Parties at the CBD COP7 in 2004 have committed to implement this WSSD target through the elaborate Programme of Work on Protected Areas. ICRI also recognized MPAs as important tools to conserve coral reefs and related ecosystems, and has adopted several policy documents including the *Recommendation on Developing MPA Networks* (ICRI General Meeting, Tokyo, 2007).

The concept and benefits of MPA networks have had a short history and practical experiences are still limited. The concept of MPA networks or similar systems is often described from an ecological point of view as conserving marine and coastal resources – particularly the fisheries where several millions of coastal dwellers are dependent – more effectively and comprehensively than individual sites could alone. However, networking also has an aspect of social/institutional/organizational connectivity to support MPA establishment and management.

In East Asia, there is a wide variety of concepts, purpose for establishment, legal systems, management bodies and frameworks, size and types of MPAs, depending on the countries. Some countries are relatively advanced while others are still at a developing stage. The limiting factors are also varied but many countries are facing problems of capacity to properly plan, establish and manage the areas, including human resources, technology, information, funding, and political and social support. Thus, most countries are still struggling with individual MPAs and not yet at the stage to develop and manage MPAs in the context of ecological networks. More apparently, transboundary protected areas (TBPAs) in marine and coastal areas or regional MPA networks/systems are considered to be a challenge in the future. On the other hand, there is some advancement in the social network aspects where several countries and/or multilateral frameworks have a network to support MPA establishment and management already in place.

The highly diverse biological and geographical conditions of marine and coastal areas in the East Asia region emphasize the importance of the approach of a “network” because it is often difficult to solve the problems of external adverse influences, conservation of migrating species and recovery of degraded ecosystems within a single MPA or localized MPA system. Moreover, many issues go beyond borders such as terrestrial run-off, eutrophication, marine debris and poaching, and, even within a country, beyond various sectors making a network approach to strengthen collaboration and cooperation among and beyond constraints of political entities and sectors, a necessity.

ICRI East Asia Initiative on MPA Networks, 2008–2010

From this background, in 2008 in Tokyo, Japan, 2009 in Hoi An City, Vietnam, and 2010 in Phuket, Thailand, relevant East Asian countries, international/regional organizations, NGOs and experts gathered to convene the ICRI East Asia Regional Workshops to ensure tangible follow-ups of information sharing, activities and policy development. The themes of these workshops also focused on MPA networks to address the priority areas of concern in the region.

At the 2008 workshop, participants discussed priority actions up to 2010 and compiled the *Provisional Plan 2009–2010*, a series of key actions that can support national efforts and regional cooperation on developing MPA networks in the region. The actions included: upgrading the regional MPA database; implementing the regional MPA status and gap analysis; habitat mapping of coral reefs and related ecosystems; identification of appropriate MPA management effectiveness systems for the region; identification of appropriate criteria for MPA networks for the region; and consideration of an appropriate regional support mechanism. A working group of more than 70 international and regional partners, including some East Asian governments, was established and addressed these actions from 2009 to 2010.

At the 2009 workshop, participants discussed and suggested priority activities based on the 2004 CBD's Programme of Work on Protected Areas, while at the 2010 workshop, the discussion was mainly focused on the regional support mechanism and finalization of the Regional Strategy. This Regional Strategy is a compilation of these discussions and activities that took place between 2008 and 2010 under this initiative.

II. Purpose and positioning

Objectives

The main issue that was recognized throughout the developing process of this Regional Strategy was the need for a workable regional mechanism for cooperation and coordination, in the first place to support future activities. This was also apparent from the fact that most of the suggested activities and recommendations gained throughout the process were more or less general and requiring further discussion and clarification of details to be converted to actual actions. On the other hand, it was also realized that various activities conducted during 2008–2010 should be followed up appropriately to make sure that deliverables will be used effectively in the region.

With this in mind, the Regional Strategy was developed based on the following three key objectives:

- Objective 1:** Formalize an appropriate regional mechanism for cooperation, information sharing and coordination in East Asia to support and enhance ICRI's objectives in the region.
- Objective 2:** Conduct tangible follow-ups on the ongoing activities under *Provisional Plan 2009–2010* and realize effective use and dissemination of each activity and deliverable.
- Objective 3:** Reflect identified priority recommendations on MPA networks for East Asia in regional and national policies.

The structure of this Regional Strategy was arranged to correspond with the above three objectives.

Positioning and definitions

This Regional Strategy is not intended to replace the existing *ICRI East Asian Seas Regional Strategy* adopted at the First ICRI East Asia Regional Workshop in 1996, but positioned as the supplementary regional strategy focused on the MPA networks. The 1996 Regional Strategy covered a wide range of themes and challenges in the region and its recommendations are still valid as many of them still need to be addressed, although nearly 15 years have passed.

As it is apparent from the three objectives, this Regional Strategy is not a comprehensive strategy on MPA networks. Rather, it focuses on what the region can realistically do cooperatively with its limited resources.

The contents of this Regional Strategy are the collective views of the East Asian partners, including 13 East Asian countries and states that have been involved in the development of this document and participated in consecutive regional workshops from 2008 to 2010. The implementing bodies for future actions are the regional partners described in ICRI's regional mechanism for East Asia discussed in this document.

This Regional Strategy is not an official document of ICRI which requires adoption by global membership through a formal procedure at the ICRI General Meeting. Neither does this document seek additional high level commitment by East Asian governments nor impose any obligations on any entities.

This Regional Strategy seeks to complement other existing programs but does not intend to compete with or duplicate existing regional initiatives and programs. ICRI's unique and informal nature will be used to fill the gaps and reflect open opinions from regional stakeholders to clarify substantial directions and realistically proposed activities.

The term "MPA network" referred to in this document is not restricted to the meaning that is defined in the existing guidelines and criteria by CBD and IUCN. It is used as a collective term to describe a wide range of ecologically selected conserved and managed areas, such as community conserved areas, practices in marine and coastal areas and transboundary arrangements which are expected to function systematically from ecological perspectives and from social/institutional/organizational connectivity aspects.

The term "East Asia" is used in this Regional Strategy following the ICRI's regional terms, and as a matter of practical convenience, to describe where the activities are focused. It does not intend to restrict involvement of, or relationships with, neighboring regions particularly where socioeconomic and biogeographical relationships are evident. The ICRI's rule document (2009) does not define which countries belongs to which region but lets the countries decide on which region they belong. The represented countries and states in the 2008–2010 workshops were: Brunei Darussalam, Cambodia, China, Indonesia, Japan, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand, Timor-Leste and Vietnam.

Review

The implementation of this Regional Strategy is expected to be reviewed, and if necessary, revised in future ICRI East Asia Regional Workshops that are anticipated to be organized periodically in association with the relevant regional events. The action items under each objective of this Regional Strategy shall serve as a baseline to evaluate the level of achievements in the event of such a revision in the future.

III. Regional Strategy

Objective 1:

Regional mechanism for cooperation and coordination

1.1. Rationale and need

In the East Asia region there are some existing sub-regional level multilateral initiatives and programs on marine and coastal conservation in place. But there is no wider regional mechanism or a network to coordinate or bridge neither the existing mechanisms, nor one which could be used as a platform for regional collaboration. From the discussions at the 2008, 2009 and 2010 workshops, regional partners agreed that such a mechanism is needed in the region, and a continuation of the ICRI East Asia Regional Workshops could be used as the main mechanism.

At the 24th ICRI General Meeting held in Monaco in January 2010, a new coordination mechanism for the Global Coral Reef Monitoring Network (GCRMN) was proposed including restructuring the regions into four larger regions; introducing regional coordination mechanisms with a supportive framework; and increasing the focus on regional activities and regional reporting. Based on this proposal, future directions for the GCRMN regional network were discussed at the GCRMN Regional Meeting for the South East and North & East Asia organized during the 2nd Asia-Pacific Coral Reef Symposium, and at the subsequent 2010 Regional Workshop.

In discussion, the participants at the 2010 Regional Workshop agreed that ICRI's regional information sharing, cooperation and coordination mechanism for East Asia shall, for the time being, be based on three main premises:

- i) Continuing to organize the ICRI East Asia regional workshops;
- ii) Strengthening the GCRMN regional coordination mechanism; and
- iii) Development of an information sharing network.

It is anticipated that these three mechanisms will be used as the platform for the regional partners, regardless of ICRI membership, to discuss, share information and implement collaborative actions in the future. These mechanisms shall be linked mutually and seek sustainable operation including mobilizing and sustaining funding. The detailed results of the discussion are reflected in a draft of the structure and procedure for the Regional Workshop (**Annex 1**), GCRMN regional mechanism (**Annex 2**) and information sharing network (**Annex 3**).

The workshop divided into two groups to discuss ecological connectivity and critical habitats, and capacity building and training. Recommendations from these groups are found in **Annex 4**.

The "short term activities" are the realistic follow-up actions to be immediately completed, improved upon and/or disseminated in the region. The "Mid-long term activities" are the relevant suggested actions which may not be realized immediately but are expected to be in the mid to longer term.

1.2. Short-term activities

- a. After further consideration and determining the appropriate regional mechanism by updating **Annex 1**, Annex 2 and Annex 3, the proposal shall be submitted for recognition at the 25th ICRI General Meeting scheduled for November 2010 in Samoa. [Actions by: working group]

1.3. Mid-long term activities

- a. Improve and maintain the regional mechanism. The appropriateness of the regional mechanism shall be reviewed at future ICRI East Asia Regional Workshops. In order to achieve a sustainable mechanism including funding, additional functionality, if appropriate, shall be identified gradually through discussion and from regional needs.
- b. East Asian countries to recognize and support the continuation and strengthening of ICRI's regional mechanism by recognizing:
 - the ICRI East Asia Regional Workshops as a useful informal regional forum for cooperation and coordination, and consider future hosting of a workshop and secure funding to send appropriate delegates.
 - and supporting national GCRMN coordinators and national coral reef monitoring activities.
 - suggestions brought forward by country representatives on critical information needs, on readily available information for MPAs and MPA networks and suggestions on information sharing.
- c. Explore the feasibility and possibility of developing an interactive web-based portal including upgrading the existing website.
- d. Digitize and archive the meeting material from the past regional workshops in an organized way on the ICRIForum.
- e. Identify gaps between countries where connectivity activities have not been initiated in the region and consider from where potential assistance and collaboration may come.
- f. Prepare an inventory of capacity building, trainers and training available in the region and in other regions where necessary.

Objective 2:

Follow-up of the Provisional Plan 2009–2010

The achievements of the *Provisional Plan 2009–2010* were reviewed and the proposed way forward was identified for each action item.

2.1. Regional MPA database

2.1.1. Achievements

The regional MPA database ‘Coral Reef MPA of East Asia and Micronesia’ developed on ReefBase and developed in 2005–2007 was further updated by data contributions from East Asian countries. 350 sites have been added and up-dated since 2007 (as of June 2010). The database system was also upgraded to be more useful for MPA development and management by adding new data and functions, e.g., several biogeographical map layers, analytical functions, country pages and an online/offline updating system. It is available on ReefBase as an open access database (<http://mpa.reefbase.org/>). Although the data coverage is not complete yet, this database could be recognized as the most comprehensive and up-to-date MPA database available in the East Asia region.

2.1.2. Short term activities

- a. Ideally all the countries will manage, update and publicize the MPA data themselves. Depending on the capacity of the country, this could be achieved either by: (i) developing its own MPA (or PA) national database; or (ii) using the ReefBase country page and updating system. The countries with their own databases should share the data with ReefBase periodically. [Actions: EA countries]
- b. The following data items are needed to give greater visibility to their status and increase the usability of the database. East Asian countries shall endeavor to collect and update these data while institutions and NGOs shall assist the countries in this effort. [Actions: EA countries, relevant organizations]
 - MPA network data [also need to think about TBPAs]
 - Community based MPA data
 - MPA boundary (polygon) data
 - Case studies and photo images
- c. It would be ideal to have the national MPA database or the country page on ReefBase also shown in its national language to allow public and local communities to use the system. Such a scheme should be explored, and if possible, provided, while East Asian countries shall contribute to data updating with two languages—their own and English. [Actions by: WFC, EA countries]
- d. The updated MPA data could be shared with the World Database on Protected Areas (WDPA), a global protected area database authorized by the CBD for global analysis, upon agreement by East Asian countries and data sharing partners. This will allow all the contributed data to be reflected in the global analysis which will be submitted to CBD COP and other formal processes. [Actions by: EA countries and data sharing partners; WFC; UNEP-WCMC]
- e. The updated MPA data shall also be contributed to and made available at the partially overlapping MPA database on ReefBase, i.e., CTI Atlas, ReefBase Pacific, and LMMA Network database and other databases such as ACB. These ‘sister’ databases shall share the data. [Actions by: WFC, ACB, donor agencies]

2.1.3. Mid-long term activities

East Asian countries and relevant organizations interested in MPA data management and use, e.g., ACB,

COBSEA Knowledgebase, UNEP/GEF South China Sea GIS and metadatabase, shall identify the status and gaps in MPA data, and consider how to avoid duplication, make best use of each database, e.g., interactive links, share data and roles, and use in their projects.

2.2. Coral reef habitat mapping

2.2.1. Achievements

Habitat mapping of coral reefs was conducted in the East Asia, Micronesia and Melanesia regions using remote sensing techniques with high resolution satellite images. Tropical/sub-tropical shallow water habitat up to 10 meters depth was classified into seven categories including live coral cover, seagrass, sandy bottom, etc. The resolution of remote sensing techniques is limited and it is not useful in understanding the detailed status of individual sites, but it has advantages in providing broad objective views of wide areas which can provide useful information to policy makers and MPA managers for MPA and MPA network planning and management. This exercise is the first of its kind in these regions in terms of coverage.

2.2.2. Short term activities

- a. The developed coral reef habitat map is to be provided as one of the biogeographical map layers on the MPA database (2.1) and is to be made available freely to the public. The map will also be provided to and made available on the CTI Atlas and ReefBase Pacific database. [Actions: MoE, WFC]
- b. To improve the accuracy of the habitat map by gaining actual status information of the habitat, further information sharing and using what has been done already by asking partners to verify interpretations, will carry the project forward. The feedback could also be used to improve data presentation on the database and develop a user guide and technical report. [Actions: Regional partners, MoE, WFC]
- c. East Asian countries shall consider and try using the habitat map for management of existing MPAs and planning of new MPAs including development of MPA networks. [Actions: EA countries]

2.2.3. Mid-long term activities

The advancement of remote sensing techniques is remarkable but the techniques are still expensive and applications limited for this region. The lessons learned from development and application of this project shall be reflected in future, similar projects in the Region to make best use of limited resources and to enhance appropriate applications. The data from this project shall also serve as the baseline for future comparison and analysis for management purposes.

2.3. Regional MPA gap analysis

2.3.1. Achievements

The ecological gap analysis procedure proposed by the CBD is generally to: identify the conservation target, analyze and map the occurrence and status of biodiversity and protected areas, identify gaps, prioritize gaps and develop a strategy to fill the prioritized gaps (www.cbd.int/protected-old/gap.shtml). Thus, the MPA database (2.1) and Habitat mapping (2.2.) have fulfilled part of the process of mapping and identifying the

regional status and occurrence of habitat and MPAs. An initial regional analysis was conducted using the existing updated data of the MPA database, but comprehensive analysis has yet to be undertaken.

2.3.2. Short term activities

- a. Use the latest updated data from the MPA database (2.1) and Habitat mapping (2.2) and information gained through workshops and activities during 2008–2010, and analyze the target, status of and gaps in MPAs and MPA networks in the region and on coral reefs and related ecosystems. The results shall be verified and reviewed by East Asian countries and relevant organizations, and compiled in a report to be shared in the region. [Actions: Working group, EA countries]
- b. East Asian countries that have not completed the MPA gap analysis shall conduct the analysis using existing available data and resources, including the MPA database (2.1) and Habitat mapping data (2.2), by referring to the CBD's guidance described above. Note that the analysis could be at any level depending on the capacity and data availability. Relevant institutions and NGOs shall provide technical and/or financial assistance to this effort. [Actions: EA countries, relevant organizations]
- c. Collaborate with ACB on assisting the completion of the ASEAN regional MPA gap analysis, national MPA gap analyses and activities related to the launch at CBD COP-10.

2.4. MPA management effectiveness system

2.4.1. Achievements

The appropriate MPA management effectiveness (ME) system for East Asia was discussed and explored within the working group and, based on that discussion and finding; a simple and easy to use EXCEL macro spreadsheet with a list of indicators for site level was developed as the first prototype for the data management tool. It was developed as much as possible from the perspectives of MPA managers who use the tool, and on the assumption that each country or MPA sites will modify and adapt the indicators and tool to their conditions.

2.4.2. Short term activities

- a. The prototype shall be reviewed and tested by MPA agencies, relevant organizations, and MPA managers, and further developed based on their feedbacks. The final product shall be made freely available on relevant organizations' websites, e.g., ICRIForum, attached with a simple user guide. [Actions: Working group, EA countries]
- b. East Asian countries shall consider having the national MPA ME indicators and systems, including their data management tool, monitoring framework, feedback system, and a database. If appropriate, consider using the above tool as the basis to develop their own set of indicators and data management tools. Relevant organizations shall assist in the development and applications of such a system. This could be jointly conducted by organizing a training or workshop. [Actions: EA countries, relevant organizations]

2.4.3. Mid-long term activities

- a. Identify a set of minimum core bio-physical, socio-economic and governance indicators that are

commonly important in all countries, at any level or type of MPA to be shared at national or regional level, or even at global level. Such data could be shared systematically through the database and used to identify which MPAs need assistance or resources to improve overall management effectiveness.

- b. Consider and identify indicators to evaluate MPA management effectiveness at country level or MPA network level.
- c. If there are certain demands, identify a set of management effectiveness indicators for specific types of MPAs, e.g., fisheries management MPAs.

Objective 3:

Reflect priority recommendations to regional and national policies

3.1. Rationale and need

On many occasions where MPA networks are discussed at international, regional and national meetings, the discussion often gets confused due to a lack of basic understanding and the range of meanings that ‘MPA network’ covers. Furthermore, the existing guidelines on MPA networks, i.e., from the CBD and IUCN, are more or less general covering the whole world including areas beyond national jurisdictions and only described from an ecological point of view. In East Asia, however, there is a huge gap between these ‘ideal’ guidelines and the reality that most East Asian countries are still struggling with establishment and effective management of individual MPAs. Thus, regional guidelines on how to realistically initiate an approach to realize a proposed ecological MPA network, particularly from the inextricable socioeconomic point of view, are needed.

A series of valuable recommendations on how East Asian countries should address MPA networks gained through workshops and activities between 2008 and 2010, but which could not be translated to a tangible action statement like the action items under Objective 1 and Objective 2, are summarized in **Annex 5** particularly from the socioeconomic perspective. Many of the recommendations were gained from the parallel group discussion conducted at the 2009 workshop where participants discussed and extracted priority suggested activities based on the 2004 CBD’s Programme of Work on Protected Areas.

This list of recommendations is expected to serve as the basis on which is developed more comprehensive and useful MPA network guidelines in the East Asia Region. This developing process shall replace Action #2–3 ‘MPA network criteria’ under the *Provisional Plan 2009–2010*. The deliverable is expected to serve as reference material for meetings at regional or national level to facilitate the discussion and hence realistically contribute to enhance MPA network development in the region.

3.2. Short-term activities

- a. Further develop **Annex 5** to complete the draft MPA network guidelines in East Asia by gaining feedback from East Asian countries, relevant regional initiatives and programs. [Actions: working group]
- b. Disseminate the deliverables to all the East Asian countries, relevant regional initiatives and programs, and NGOs by posting the material on relevant websites including the ICRIForum and presenting it at relevant meetings.

3.3. Mid-long term activities

East Asian countries, relevant regional initiatives and programs and NGOs to consider adopting these regional MPA network guidelines and encourage using them as reference material in future regional and national meetings on MPA networks.

Annex 1.

PROPOSED STRUCTURE AND PROCEDURE OF THE ICRI EAST ASIA REGIONAL WORKSHOP

1. Objectives

The ICRI East Asia Regional Workshop aims to provide a platform for the regional partners to:

- Share information, lessons learned and opportunities
- Raise political will and maintain motivation
- Discuss and coordinate actions on common, priority and emerging issues
- Facilitate and strengthen mutual cooperation and networking among countries and organizations
- Fill the gaps and link existing initiatives, programs, regional strategies and action plans
- Monitor the program of implementation
- Identify the lessons learned

2. Positioning

- The workshop will be organized as an ‘ICRI Regional Workshop’ which is the meeting category of ICRI defined in the Organization and Management Procedure for ICRI (ICRI 2009). The geographical target ‘East Asia’ follows the ICRI’s regional definition.
- The ICRI Regional Workshop does not have a formal procedure like the ICRI General Meeting. Any documents derived from this workshop are not official ICRI documents requiring formal process and adoption at the ICRI General Meetings. A Motion in a draft form could be submitted to the ICRI General Meeting for consideration, and if appropriate, could be adopted as an ICRI formal document.

3. Structure and funding

- **Organizer and Host country**: The organizer of the workshop should include at least one ICRI member country (government). Organization and non-ICRI member countries of East Asia are also eligible to co-host the workshop with the ICRI member country. It is expected that the ICRI Secretariat will always join in the co-organization of the workshop.
- **Secretariat functions**: A secretariat like the ICRI Secretariat will not be arranged. Host countries shall appoint a contact person and necessary staff to arrange and support the logistics of the workshop.
- **Participants**: The workshop opportunity will allow participation from a wide range of stakeholders from inside and outside the region, including ICRI member countries, non ICRI member countries, intergovernmental organizations, international and regional organizations, NGOs, and experts.
- **Funding**: All the necessary direct and indirect expenses in relation to the workshop shall be covered by in-kind contributions or mutual support by the host country(s), co-organizers and participants. The organizer shall mainly prepare the organizational costs (i.e., venue, audio equipment, etc.) and costs for

travel support for some of the participants. Participants shall endeavor to secure their own funding to participate in the workshops.

4. Procedure and form

- **Opportunities and timing:** In order to reduce the organizational and travel costs, the workshop shall be organized in conjunction with, or as a side event of relevant meetings in the region where many of the regional partners will be already participating, including ICRI General Meetings, PEMSEA's East Asian Seas Congress and the Asia Pacific Coral Reef Symposium. On the other hand, the workshop should not coincide with relevant worldwide events, such as the Global Oceans Conference, IMPAC, etc. that will be held in other regions. To provide fair opportunities for all the relevant countries to host the workshop, future locations shall be chosen in rotation.
- **Intervals:** The workshop shall be held no more frequently than once a year to allow countries to apply for and secure organizational and travel budgets. On the other hand, to keep the momentum and to follow-up the activities, the intervals should not be longer than three years.
- **Meeting materials and outputs:** To reduce the burden to the host country(s), the administrative tasks of the workshop should also be reduced as much as possible. The meeting material and the Summary Record should be produced for effective organization of the workshop and keeping the institutional memory of ICRI, but should be brief with essential points carefully recorded. The ICRIForum should be used effectively for posting this material and the meeting information, i.e., agenda, travel and accommodation, registration.
- **Representation at ICRI GM:** The host country(s) and organisations shall represent the region at the ICRI General Meetings to report back about the results of the workshop, and to reflect the status, challenges and messages from the region to the discussion at the General Meeting. When the Host country(s) and organisations cannot afford to travel to the General Meeting, the ICRI Secretariat shall be requested to prioritize supporting the host country secretariat.

5. Agenda to be discussed

- The agenda of the workshop could be anything in relation to conservation and sustainable use of coral reefs and related ecosystems, particularly on the common, priority and emerging issues in the region.
- The workshop shall determine the: (a) Follow-up work plan and schedule until the next workshop; (b) Tentative time and location of the next workshop; (c) Host country, organizing structure, and each role for the next workshop; and (d) Budget expectation and plan.
- The appropriateness of the regional mechanism shall be reviewed and evaluated at every workshop and any suggestions for improvement shall be considered and addressed whenever possible.

Annex 2.

POTENTIAL GCRMN REGIONAL COORDINATING MECHANISM FOR EAST ASIA

1. Introduction

The Global Coral Reef Monitoring Network (GCRMN) has been coordinated by 17 Node coordinators for improving coral monitoring capacity. As a result, GCRMN produced the Status of Coral Reefs of the World every two years since 1998. Southeast Asia (SEA) and East and North Asia (ENA) nodes work with the national/state coordinators to collect and compile their monitoring data to provide regional chapters for these global reports. By sharing the information within the region, coordinators and their supporters have organized the Asia Pacific Coral Reef Symposia (APCRS) every four years since 2006 to provide a venue for a scientists' network. They also announced the establishment of the "Asia Pacific Coral Reef Society (APCoRS)" during the 2nd APCRS in Phuket, Thailand to strengthen the network and provide a stronger regional body. However, SEA and ENA node countries and states need to improve their monitoring capacities to provide scientific information for public audiences and inform decision makers to conduct conservation and management activities at national and regional levels. Thus, there is a strong need for Regional Coordination to support the existing coordinators to improve capacities for coral monitoring and conservation in the region.

2. Needs from countries and areas

- **Improve monitoring capacity**

Need to regularly identify gaps in monitoring capacity within each country/state, especially in response to natural and anthropogenic stressors/events, e.g. El Niño, oil spills, etc.

- **Provide scientific information for the public**

Need to identify communication strategies within each country/state to translate scientific information to the general public in a relevant and timely manner, e.g. the consequences of coral bleaching or oil spills to livelihoods and how to overcome them.

- **Encourage decision makers to conduct conservation and management actions**

Need to identify gaps in conservation and management action plans in each country/state at various implementation levels and devise strategies to encourage decision and policy makers to address the issues.

- **Exchange information on monitoring and management within and beyond the region**

Need to identify existing sources/databases on coral reef data and information, and develop a strategy for information sharing between agencies/institutions, e.g. integrating data and information between ReefBase, ACB, national databases like Terangi.

3. Roles of Existing Node and National/State Coordinators

- **National and/or State Coordinators**

The role of National/State coordinators is to: 1) collect and compile data and information; 2) provide national or state reports on coral status for node summary in the regional status report.

- **Node Coordinators**

The Node coordinators: 1) support national/state coordinators to collect and compile national/state monitoring data and information: 2) prepare a node summary for regional status reports and 3) support APCoRS for sharing monitoring information.

4. Potential Role of Regional Coordinator and Necessary Support

- **Regional Coordinator**

The Role of Regional coordinator could be: 1) to support national/state coordinators to improve their capacity on monitoring; 2) to involve decision makers and other stakeholders for conducting conservation and management activities at national/state levels; 3) assist countries/states in funding allocations for monitoring and training; 4) to coordinate governments, international organizations and regional coordination bodies to improve monitoring and conservation activities in the region: and 5) coordinate reef status reporting within and outside the region.

- **Necessary Support**

The regional coordinator position should be hosted by an agency or institution that will support the prescribed roles and activities of the coordinator, and which will be willing to provide logistical support for the position as required.

5. Upcoming regional and potential future activities on Regional Coordination

Upcoming:

- Development of the East Asia Regional Status Report in October 2010
- Synthesis of this report into GCRMN Regional Report in 2011
- Support the activities of Asia Pacific Coral Reef Society
- Support the organization of the 3rd Asia Pacific Coral Reef Symposium in 2014 in Taiwan

Potential:

- Create and secure a Regional Coordinator position including commitment from the host institution
- Coordinate regular regional publications, i.e., Regional Status Report
- Coordination between agencies with existing coral reef data, e.g. ACB, COBSEA, UNEP-SCS, ReefBase
- Facilitate regional and national/state workshops and training to enhance monitoring activities
- Facilitate regional and national/state workshops for development of coral reef management strategies *including policy development*

Annex 3.

RECOMMENDATIONS ON INFORMATION SHARING

Small group discussions on critical information needs, on readily available information for MPAs and MPA networks and suggestions on information sharing were convened.

1. Critical information needs

Critical information needs identified included:

- Location of critical habitats and their area size
- Biological Information
 - Community structure
 - Habitats
 - Nursery areas
 - Species and biodiversity information
 - Levels of threat (endangered, etc.)
- Bio-physical Information
 - Tides and currents
 - Climate
 - Oceanography
 - Related terrestrial information
 - Rivers and submarine water discharge
 - Land use
- Threats
 - Contaminant distribution
 - Contaminant impacts
 - Land based sources
 - Run-off
 - Sediments
 - Climate Change Issues
 - Fishing – related threats
 - Tourism – related threat
- Connectivity
 - Marine Biogeographic Regions
 - Similar and / or associated Ecosystems
 - Larval Dispersal Information
 - Ecosystem Resilience
- Governance
 - Enforcement

- Stakeholders and community support
- Phylogenetic Information
- Population Dynamics
- Models
 - Foodweb
 - Hydrodynamic Information
 - Connectivity
 - Larval Dispersal

The group also recommended that certain criteria should be entertained to prioritize the suggested information requirements

- Data availability
- MPA as the primary source of information generated
- Data generation affordability

The group also suggested that all information should be map-based.

2. Readily available information

Readily available information identified was in the following types and forms:

- Basic Profiles of MPAs
- Bio-physical information (size, location, habitat)
- Socio-economic
- Polygon data
- Problems and Threats
- Regulations
- Research
 - On-going
 - Research needs
- LMMA
- Management Effectiveness
- MPA Networks Information, e.g. Turtle Island Heritage Protected Area.
 - Connectivity (larval transport)
 - Migratory pattern
- Large Marine Ecosystems
- Lessons Learned
- Species Information by Location and by Country
 - Status

- Habitat information
- Management Plan with Zoning Plan

The formats of readily available information are:

- Maps
- Report
- Species List
- Web

3. Suggestions on information sharing

- Paper-based information, e.g. newsletter, journal articles, CD-Rom
- Face-to-face symposium / interactions, e.g. symposia, study groups/tours, briefings with politicians/policy makers
- Internet, E-forum (existing, such as in SCS project, but needs coordinator) E-learning- lectures, e.g. audio, mp3 or video format, lectures, recordings posted on the web. Mailing –list, contact list.
- combination of live and internet communication Computer-based / internet based, e.g., Reefbase for verified information, facebook for announcing upcoming events and unverified data, combination of live and internet presentations, e.g., go-to-meeting software, Skype/teleconferencing, video conferencing.

The group concluded that most of the sharing schemes are internet-based. But we should not preclude the use of traditional methods. Micronesia, for example, doesn't have fast internet, therefore, there is still a need for paper-based information.

Note that the internet can be unreliable. Thus, there is a need for the following:

- Differentiate between external and internal (log-in, intranet) for general audience and core active members,
- include relational databases and interactive maps,
- organize information for subgroups for specific concerns e.g. coral bleaching (i.e. topic based).

Annex 4a

RECOMMENDATIONS ON ECOLOGICAL CONNECTIVITY AND CRITICAL HABITATS

The recommendations from the 6th ICRI East Asia Regional Workshop for further consideration are:

1. Share information, i.e. case studies of existing projects. Use this shared information and the data set that exists and analyse these sets into action programs that provide actions to illustrate connectivity.
2. Identify existing biology, ecology and oceanography including currents and wind direction that exist in the region, not yet covered by regional initiative.
3. Choose particular species (IUCN Red List) and/or habitat to concentrate connectivity deliberations and link to marine habitats and larger marine ecosystems.
4. Determine how to identify critical habitats and how to establish connectivity patterns.
5. Scientists to contribute to existing projects on connectivity.
6. Assess candidate areas considering all deleterious effects that may impose on the site.
7. For connectivity, need many models, knowledge on threats and relationship between habitats and the stages of life in which the animals live. Tap into regional and international science and research on connectivity and its implications.
8. Hold a workshop to cooperate with on-going projects.

Annex 4b

RECOMMENDATIONS ON CAPACITY BUILDING

The recommendations from the 6th ICRI East Asia Regional Workshop for further consideration are:

1. Use capacity building programs in the region, e.g., the proposed DMCR Program with the University of Hawaii funded by NOAA, with possible use for regional capacity building.
2. Take courses in climate change impacts and mitigation, and probabilistic ecosystem risk analysis.
3. Collect existing capacity building methods from the region with the aim of developing guidelines to standardization capacity building, e.g. Indonesia standardizes all school curricula, media.
4. Assess training and capacity building in the region and priorities where efforts in capacity building are needed.
5. Develop the capacity to identify and provide an inventory of coral fauna and flora.
6. Determine and use the human and other resources for monitoring including socioeconomic (SocMon) and development of monitoring protocols, within country or between countries in the region.

Annex 5.

RECOMMENDATIONS FOR MPA NETWORK DEVELOPMENT

IN EAST ASIA

1. Objectives

This document is a compilation of various recommendations gained through workshops and activities during 2008 and 2010 on MPA networks and other related activities. Major inputs were from the parallel group discussion conducted at the 2009 workshop where participants discussed and extracted priority suggested activities based on the 2004 CBD's Programme of Work on Protected Areas. This document aims to provide the basis for discussion to develop an appropriate regional guideline on MPA networks.

The MPA network guidelines from ecological perspectives are already in place, and many of the recommendations gained during 2008–2010 were socioeconomic perspectives. Thus, this document focused mainly on the socioeconomic and governance recommendations and only briefly outlined the ecological perspectives described in 2 below.

2. Basic understanding of MPA networks

IUCN defines an MPA network as: *“A collection of individual MPAs or reserves operating cooperatively and synergistically, at various spatial scales, and with a range of protection levels that are designed to meet objectives that a single reserve cannot achieve”* (IUCN-WCPA, 2008) which describes the overall ecological concept of the term.

On the other hand, CBD refers to the “global network” of protected area in its “Programme of Work on Protected Areas”, as: *“provides for the connections between Parties, with the collaboration of others, for the exchange of ideas and experiences, scientific and technical cooperation, capacity building and cooperative action that mutually supports national and regional systems of protected areas which collectively contribute to the achievement of the programme of work”* (COP 7 Decision VII/28) which clearly illustrates the aspects of a social network.

The ‘Scientific guidance for selecting areas to establish a representative network of marine protected areas, including in open ocean waters and deep-sea habitats’ was adopted in the CBD COP 9 (Decision IX/20) and this provides the basic guidance for establishment of MPA networks from an ecological point of view. The five ecological guidelines are: (1) Ecologically and biologically significant areas; (2) Representativity; (3) Connectivity; (4) Replicated ecological features; and (5) Adequate and viable sites. A similar but more detailed guidance is provided from the book ‘Establishing Resilient Marine Protected Area Networks—Making it Happen’ (IUCN 2008).

3. Recommendations

The list of recommendations gained throughout the 2008 and 2010 workshops revealed that they could be summarized into the following three core strategies that East Asian countries shall apply in the process of development and management of MPAs, MPA networks and other related conservation and management activities.

East Asian countries shall:

- 1) Breakthrough individual and/or sectoral approaches but apply wider, flexible and cooperative approaches;
- 2) Recognize its own characteristics and acknowledge traditional conservation and management methods to build a commensurate approach best suited to respective countries and sites; and
- 3) Apply a realistic and practical approach to maximize limited resources.

The following list of recommendations was classified into the three core strategies described above.

3.1. Wider, flexible and cooperative approach

- **Socioeconomic benefits and incentives**: An ecological MPA network is a concept which is often difficult to imagine due to its large spatial coverage and complicated ecological design and expectations. Thus, there needs to be a clear explanation of the benefits of the network from the ecological and socioeconomic point of view to raise incentives to support the development of the system, e.g., to network among relevant MPAs could reduce overall the management and maintenance costs by sharing information, resources and/or facilities, while it could also induce synergetic effects between MPA managers working together.
- **Social network support**: The basic concept of an MPA network defined by IUCN (IUCN-WCPA, 2008) is from the ecological point of view, but it is also used to describe the organized group of people, projects and institutions that support the establishment and management of the MPA. When such a mechanism is not in place or not functioning, adequate results may not be expected, even if the design and concept of the ecological network is adequate. Thus, the ecological and the social networks should be seen as essential components in combination to fulfill the expected conservation and management objectives. Countries are encouraged to develop such a national level social network.
- **Integrated coastal management (ICM)**: Human activities are the major cause of degradation of coral reefs and related ecosystems. MPAs fulfill various functions from biodiversity conservation to generating income sources from fisheries and tourism. What MPAs can protect is limited, therefore MPAs, especially those that are adjacent to river mouths or land, should address mitigation of adverse human activities on the land, such as, terrestrial run-offs, sewage discharge and coastal development, otherwise the effect of the MPA could be reduced. From that perspective, it would be safer to establish MPAs at locations where they are less influenced from land activities, or at areas where there is sufficient tidal current flow to quickly remove pollutants. On the other hand, nutrient-rich estuaries of saltmarsh and mangroves could be used as multi function MPAs to take up the nutrients and to offer a sanctuary for birds and nursery grounds for juvenile fishes.
- **Trans-sectoral cooperation**: The networking process of expanding the stakeholders and mutual interactions can potentially invite conflicts of interest between existing sectors where collaboration was limited, while building trust among partners takes time. On the other hand, breaking though the existing barriers and working together could provide common and/or alternative benefits and induce synergistic effects in a longer term. Stakeholders should try to determine the common benefits in the development and management of MPA networks and use them as a good reason to start collaborating.
- **Involvement of community and stakeholders**: It is recommended to involve practitioners and

stakeholders in all steps of MPA and MPA network development and management by applying co-management. This process requires extensive consultation efforts at the initial stage, but is expected to induce a synergistic effect to improve the process once the relationship is established. The recommended local stakeholders to involve are: local government, local environment NGOs, local fishery cooperatives, local industry groups including tourism, the private sector and local educational groups. It has also to be noted that the types of partnership or collaborations may vary depending on the stakeholders, hence may require different approaches.

- **Introduction of co-management:** Development and management of MPAs and MPA networks requires certain resources and different capabilities which are often beyond the capacity of one government agency. Using co-management could disperse the burden of respective management bodies, take full advantage of the expertise of each member, i.e., government, public sector, NGOs, community, suggest the introduction of public funds and techniques and increase collaboration. For example, building cooperation between the coast guard and local fishers could enhance enforcement and effective governance by increasing the detection of illegal activities. Aside from co-management between different levels of entities, the possibilities of horizontal or vertical integration of agencies or organizations to increase efficiency while decreasing duplication, should also be explored.
- **Foster a sense of common property on MPAs:** Conservation and management efforts of MPAs in one country will benefit MPAs and ecosystems of the neighboring countries. Likewise, the adverse anthropogenic impacts caused in one country will influence the others. Countries should enhance mutual cooperation and seek for more collaborative ways to co-manage the MPAs with neighboring countries and regions, through transboundary MPAs or multilateral MPA networks. A specific bilateral/multilateral agreement should be exchanged for such an operation to induce cooperation without prejudice to the delimitation of common maritime boundaries.

3.2. Traditional and commensurate approach

- **Development of specific criteria and categories:** Given the high diversity of ecological and socioeconomic conditions in East Asia, attempts to apply common criteria or categories are considered unrealistic. The appropriate criteria and categories for MPA and MPA networks differ from country to country, and these must be defined by each country based on its socioeconomic, cultural, traditions and governance circumstances and the biophysical features, taking into account the standard criteria and categories suggested by the CBD and IUCN. Hence, the CBD and IUCN will provide a more generic or over-arching framework.
- **Development of a National Action Plan:** Each country is recommended to develop its own National MPA network Action Plan (or Strategy) along with the development of its own MPA and MPA network criteria and categories. These strategic documents should be linked with the regional strategies and action plans, and it is expected that this Regional Strategy will be referred to when developing such a policy document.
- **Appropriate practices:** It is useful to learn from best practices or advanced practices from inside or outside the region. However, it has to be noted that many of the best practice MPAs have more advantages from the beginning, e.g., of higher tourist attraction, and it may not be easy to introduce their practices to other MPAs. Thus, countries shall seek 'appropriate practices' which are best suited management practices for respective MPAs considering the characteristics and long-term sustainability.
- **Recognition of indigenous and community conserved areas:** In East Asia, there are various types of

marine and coastal areas that have been conserved and/or managed in effect through traditional, cultural or religious means by indigenous people and communities, although they are not legally designated or recognized. An example is the ‘sasi’ system in Indonesia. The idea of IUCN’s protected area management category (IUCN 2008) is not to eliminate such areas or means when they don’t fulfill the criteria, but rather to facilitate understanding of the status and to encourage recognition of a wider variety of protected areas. Moreover, such areas or means could be more valuable in terms of traditional values and sustainability. Thus, national or local governments should proactively recognize and support such areas or means in the broad sense of MPAs.

- **The recognition of seasonal MPAs:** Taking into account the importance of protecting spawning aggregation areas and nursery areas interlinking habitat protection, national or local governments should recognize and support seasonal protected areas.
- **Is MPA the best tool?:** The MPA is not an ‘independent’ tool but has to be used to complement or in conjunction with other management measures such as ICM and sustainable resource management. The MPA and MPA network have relatively better chances to attract external attention and funding opportunities for conservation and management, but whether or not the MPAs or MPA network are the best suited tool for conservation and management for a particular area should be carefully examined along with other tools or means.

3.3. Realistic and practical approach

- **Regional level MPA network:** Development of comprehensive regional or sub-regional level ecological MPA networks from the designing stage is difficult from a technical point of view due to the ecological complexity, but could be more difficult from a socioeconomic point of view because negotiations and coordination between different nations are expected to be challenging, and hence not a realistic approach for East Asia. The suggested approach would be to prioritize the development of a national network, or specific network for an ecosystem or certain animals, such as sea turtles, where the merits of multilateral cooperation are evident. A realistic regional or sub-regional MPA network in East Asia could be developed as a result of combining and filling the gaps between several individual MPA networks. Thus, information exchange and cooperation from an early stage of each development would be crucial.
- **National level MPA network:** Likewise at the regional level, if a comprehensive approach is difficult, an alternative and realistic way for developing a national MPA network could be to start by establishing an individual network of animal conservation areas or habitats. These areas would have higher information availability, be easy to monitor, be attractive to the public, etc. such as, dugongs, sea turtles, coral reefs and mangroves. The representative national network of MPAs does not necessarily have to be complete from its planning stage but could evolve gradually by adding these individual networks effectively to the existing network.
- **Improve existing MPAs:** The establishment of MPA networks takes a considerable amount of time and effort, while more effort should be focused on improving existing MPAs by evaluating, identifying and filling the gaps to increase management effectiveness. Such a reviewing process should not be undertaken individually for respective MPA sites, but overall to enable the evaluation of the potential contribution at the network level and/or connectivity between each MPA site.
- **Introducing an ecological network to new MPAs:** The concept of an ecological network should be introduced as the national standard for establishment and management of any new MPA to increase the

total effectiveness of conservation and management.

- **MPA size and function:** It is commonly recognized that the larger the MPA the more effective the conservation becomes. This concept however is only valid under effective management, and the requirement for maintenance, provision of the necessary resources, and the difficulty of establishment will most likely increase in proportion to the size. If many conflicts are expected when establishing a large MPA, or the capacity and/or resources to manage such a large MPA are not sufficient, the recommended way would be to start from a realistic size and conservation level capable of being managed and accepted by the stakeholders. The size and level of conservation area can be increased gradually as the increase in public support and understanding, and the capacity to manage the area increases.
- **Introduction of no-take areas:** The fundamental concept of an MPA is strict conservation by having no-take areas where spill-over and other ecological effects, such as maintaining regional resilience to pressure, can be expected. In East Asia however, many MPAs are not no-take zones and people are living within these areas, with a reliance on the marine resources for food. Thus, excluding those people who have been depending on and using the resources for a long time may raise many conflicts, and such an approach is likely to take time and/or end up being costly for compensation, etc. It is important to ensure that food security is not compromised in the long term. An approach could be to establish a small-scale collaborative demonstration site with local communities closing an area for a certain period to monitor the effect of no-take. Such an approach may take time but could be successful in the longer term once the merits are fully recognized by the local community and the method will, hopefully, “spill-over” to the neighboring communities. Another approach would be to reduce extractive use in an MPA, i.e., implement zoning according to the risks to the habitat and species within the MPA.
- **Practical use of science and information:** Ideally, the establishment and management of MPAs and MPA networks should be based on adequate scientific information particularly to identify which areas serve as spawning, feeding and nursery grounds, and sink/source of juvenile fish/corals. However, recognizing that urgent actions are needed, and it takes a considerable time and cost to get such information, best available science, tools and local knowledge should be used as a priority. Meanwhile, more strategic research and monitoring are required for larger MPA network development. This information should be made readily available in a simple form to local MPA managers. Sound science, however, is required for measuring management effectiveness and adaptive management.
- **Sustainable resource management and use:** MPAs that allow a certain level of resource use within the area through, e.g., fisheries and tourism activities, should introduce sustainable resource management measures to maintain the balance between conservation and securing the local economy and livelihood. Appropriate standards for sustainable tourism and existing management tools for fisheries, e.g. Fishery Refugia (developed by SEAFDEC) should be applied.
- **Consideration on the costs and benefits of MPAs:** In many cases, the long-term management running cost of MPAs such as staff costs, equipment, enforcement, livelihood support, etc. are not well considered compared to the costs for establishment. In order to avoid MPAs being recognized as a ‘burden’ on administrative expenditure, there should be a detailed study on the expected, projected income/expenditure at the planning stage. MPAs should be established at an adequate size and function that is manageable within a realistic budget setting up ring-fencing mechanisms to use collected fees in the management objectives of the MPA. Efforts should be placed at undertaking cost benefit analysis including benefit sharing for MPAs, preferably as part of the planning process.
- **Sustainable financing:** The appropriate sustainable financing mechanism to maintain the MPAs

without expecting/ relying on external funding sources should be explored for existing and new MPAs. Consideration should be given as to which methods are best suited for each MPA from various case studies, e.g., introduction of entry fees/ a green fee system, development of private/public partnerships, development of social capital networks, and trust funds or revolving funds, e.g. Integrated Protected Area Fund, Philippines. Payment for ecosystem services may be used to facilitate social equity.

- **Practical awareness raising and educational programs:** To raise awareness about the importance of the ecosystem and why proper management is needed is a fundamental point to enhance MPAs. MPA educational material should be incorporated in the national school curricula. A practical awareness raising and an educational program to target audiences, such as local people, tourists and politicians and local government officials should also be introduced.