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To cite this article: Anne Walton , Alan T. White , Stacey Tighe , Porfirio M. Aliño , Lynette Laroya , Agus Dermawan , Ahsanal Kasasiah , Shahima Abdul Hamid , Agnetha Vave-Karamui , Viniu Genia , Lino De Jesus Martins & Alison L. Green (2014) Establishing a Functional Region-Wide Coral Triangle Marine Protected Area System, Coastal Management, 42:2, 107-127, DOI: [10.1080/08920753.2014.877765](https://doi.org/10.1080/08920753.2014.877765)

To link to this article: <http://dx.doi.org/10.1080/08920753.2014.877765>



Published online: 12 Feb 2014.



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Establishing a Functional Region-Wide Coral Triangle Marine Protected Area System

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The six Coral Triangle countries: Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands, and Timor-Leste, each have evolving systems of marine protected areas (MPAs) at the national and local levels. Now with more than 1,900 MPAs covering 208,152 km² (1.6% of the extended economic zone for the region), the Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security has endorsed a Regional Plan of Action that contains a target of establishing a “Coral Triangle Marine Protected Area System” as part of its third goal on improving MPA management. This article details the contents of the Coral Triangle Marine Protected Area System Framework and Action Plan and describes its development and potential contribution to the improved management in the region once it is implemented. The MPA System Framework, as endorsed by the six countries, contains guidance for standardizing how MPAs and MPA networks are evaluated for effectiveness, and provides options for scaling-up existing MPAs to networks of MPAs that are more ecologically linked, integrated with fisheries management and responsive to changing climate. The Framework establishes an institutional mechanism by which the regional entity can facilitate the continued development and implementation of a region-wide MPA system that provides incentives for improved quality of management and enhanced marine area coverage at the local scale.

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Keywords coastal management, Coral Triangle countries, marine protected areas, marine spatial planning

Context and Scaling-Up of MPA Networks or Systems

Located along the equator at the confluence of the Western Pacific and Indian oceans, the Coral Triangle (CT) region encompasses the six countries of Indonesia, Malaysia, Papua New Guinea, the Philippines, Solomon Islands, and Timor-Leste (CT6). Collectively, these countries are responsible for managing the natural resources and needs of resource-dependent communities. An area encompassing 6 million square kilometers and home to 393 million people, the Coral Triangle is considered the epicenter of marine biodiversity (Allen 2007).

Across the six countries, more than 130 million people depend directly on fish and other marine resources as their principal source of income, food, and livelihoods (Burke et al. 2012). These resources are under significant and increasing threat, with more than 85% of the threats coming from local direct exploitation (fishing) or watershed-based pollution and the impacts of coastal development (Burke et al. 2012) (see Figure 1, Introduction, this issue). When the influence of rising sea temperatures is combined with these local threats, the portion of reefs rated as threatened increases to more than 90%, which is greater than the global average of 75%.

The threats from local direct exploitation and pollution can be directly reduced by marine protected areas (MPAs) and networks of MPAs. By increasing reef resilience and

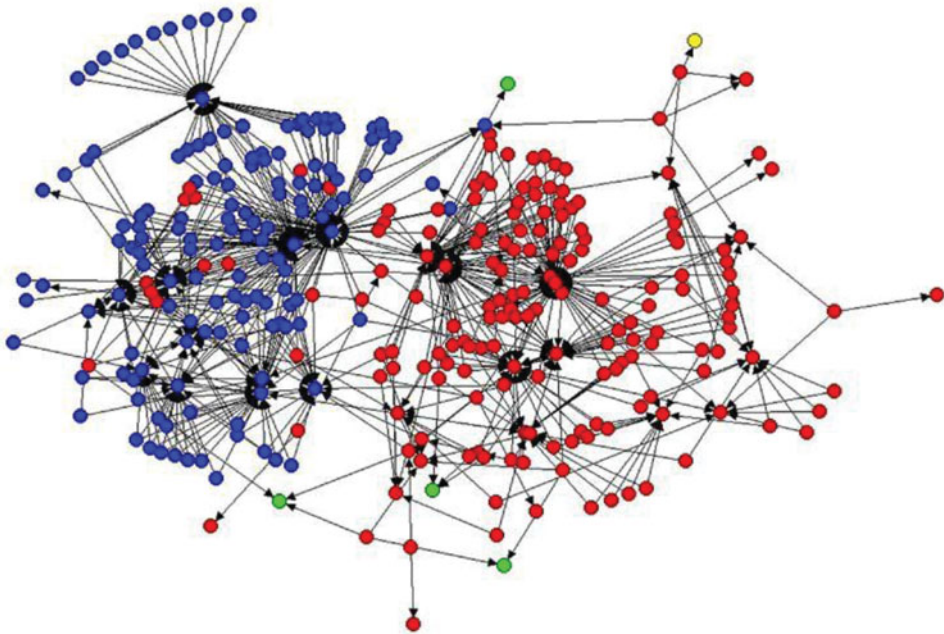


Figure 1. For MPA management, two local government barangays in the Philippines have social network connections within each barangay and across their boundaries. Red and blue circles represent each barangay. Such social networks are important to engage a large number of stakeholders who both benefit from and influence the success of the MPA (Gonzalez and Christie 2011).

Table 1
Seven MPA principles and nine CTI-CFF principles to guide the CTMPAS

MPA Principle #1	Develop and implement all programs and activities with the principles stated in the CTI-CFF RPOA
<i>RPOA Principle #1:</i>	CTI-CFF should support people-focused biodiversity conservation, sustainable development, poverty reduction and equitable benefit sharing..
<i>RPOA Principle #2</i>	CTI-CFF should be based on solid science.
<i>RPOA Principle #3</i>	CTI-CFF should be focused on quantitative goals and timetables adopted by governments at the highest political levels.
<i>RPOA Principle #4</i>	CTI-CFF should use existing and future forums to promote implementation.
<i>RPOA Principle #5</i>	CTI-CFF should be aligned with international and regional commitments.
<i>RPOA Principle #6</i>	CTI-CFF should recognize the transboundary nature of some important marine natural resources.
<i>RPOA Principle #7</i>	CTI-CFF should emphasize priority geographies.
<i>RPOA Principle #8</i>	CTI-CFF should be inclusive and engage multiple stakeholders.
<i>RPOA Principle #9</i>	CTI-CFF should recognize the uniqueness, fragility and vulnerability of island ecosystems.
MPA Principle 2	Be inclusive. Include a wide spectrum of partners and stakeholders to encourage commitment and appropriate design/approaches; include in the CTMPAS all sites that are listed in the CT Atlas.
MPA Principle 3	Integrate seascapes, fisheries, climate change adaptation, as well as threatened, charismatic and migratory species in all aspects of MPA selection, networks and management.
MPA Principle 4	Aim for social equity in all interactions, sharing of costs and benefits among stakeholders, and respect for the culture and indigenous heritage of all impacted stakeholders.
MPA Principle 5	Acknowledge and respect the national processes of other countries in recruiting sites and networks, actions or reporting.
MPA Principle 6	Acknowledge and respect the rights and sovereignty of each country over their international boundaries and mandates for MPA establishment.
MPA Principle 7	Strive to apply the most current science and knowledge towards improving MPA design and implementation within an adaptive management system.

reducing the compounding effects of multiple threats, MPAs can also indirectly mitigate coastal and thermal stress-related threats (Green, White, and Kilarski 2013). Individually, most of the CT countries initiated the establishment of MPAs in the mid-1970s and 1980s with the primary management objective focused on biodiversity protection. Since then, MPAs have increasingly been emphasized in international forums as tools to maintain and improve the status of critical coastal habitats, improve fisheries and enhance adaptation to climate change. With more than 1,900 MPAs listed or established across the six countries (Table 1; White et al. 2014), these numbers reflect a wide range of approaches, with some countries (particularly Indonesia) tending to establish mostly large MPAs, while others (the

Philippines, Papua New Guinea and Solomon Islands) are more likely to establish small community or local government-based MPAs (Green et al. 2011; Green, White, and Tanzer 2012; Green, White, and Kilarski 2013; White et al. 2014).

While many MPAs exist within the Coral Triangle, there are very few that are effectively managed (Green et al. 2009; Burke et al. 2012; Maypa et al. 2012; DCAFS 2012), and fewer still have been planned as ecological networks (e.g., Green et al. 2009, 2011; Wilson et al. 2011). The MPAs altogether include 17.8% of the region's coral reef area, but less than 6% are considered partially or fully effective in achieving their objectives (Burke et al. 2012; White et al. 2014). Many of the MPAs suffer from a lack of good governance and enforcement, and do not achieve the objectives for which they were intended. It is strongly believed that through partnership and collaboration, the Coral Triangle MPA System¹ can promote and encourage the strengthening of individual MPA sites and networks/systems needed to create or improve national or regional coastal and marine resource management (CTI-CFF 2013).

Most individual, small-scale MPAs, alone, seldom meet their management objectives of biodiversity protection, economic sustainability of communities, food security, and/or building the capacity for resilience to change. In order for MPAs to meet any one of these objectives, their size needs to be large enough to achieve its objectives and placement needs to be strategic (Green et al. 2014). However, this is easier said than done as inadequately planned large-scale MPAs often come into conflict with other political, social, and/or economic agendas (Lowry, White, and Christie 2009). Consequently, single large-scale MPAs that are able to effectively meet their management objectives are neither practical nor supported in most regions of the world. Thus, designing MPA networks or systems consisting of a series of small to moderately sized MPAs may help to reduce socioeconomic impacts without compromising conservation and fisheries benefits (PISCO 2007). Additionally, well-planned networks/systems of MPAs provide important spatial links needed to maintain ecosystem processes and connectivity, as well as improve resilience by spreading risk in the case of localized disasters, climate change, failures in management or other hazards, and thus help to ensure the long-term sustainability of fisheries resources and overall biodiversity protection better than single sites (NRC 2000 from IUCN-WCPA 2008).

Science and lessons learned from the field provide clear indications that the biological connectivity and resilience factors of functional MPA networks/systems can make significant contributions towards addressing some of today's most compelling management challenges for natural resource managers including: catastrophic events, individual and cumulative human use impacts, natural perturbations, political and social instability, and the effects each of these has on coastal and marine resources (Fernandes et al. 2012; Green et al. 2014), while showing benefits in meeting broader and more inclusive management objectives in the following areas (IUCN-WCPA 2008; Varney et al. 2010):

ECOLOGICAL—A network can help maintain functional marine ecosystems by encompassing the temporal and spatial scales of ecological systems.

SOCIAL—A network can help resolve and manage conflicts in the use of natural resources among human communities.

GOVERNANCE—A network can facilitate a coordinated and consistent integrated management framework for marine resource protection.

This article describes the development of the *Coral Triangle Marine Protected Area System (CTMPAS) Framework and Action Plan* and reviews its contents. Its

potential contribution to the improved management of marine resources in the region is discussed.

The Process and Methods to Develop the CTMPAS

In 2007 the governments of the Coral Triangle established the Coral Triangle Initiative for Coral Reefs, Fisheries and Food Security (CTI-CFF) (see Introduction, this issue). In 2009, to facilitate coordinated action for marine conservation and resource management, the leaders of the six Coral Triangle countries agreed to a 10-year (2010–2020) *CTI-CFF Regional Plan of Action* (RPOA; CTI-CFF 2009). The third of five goals identified under the RPOA is “marine protected areas (MPAs) established and effectively managed,” and this goal has one target: “a region-wide Coral Triangle MPA System (CTMPAS) in place and fully functional.” This target, which calls for regional planning and action among the Coral Triangle countries, underscores the importance and cross-jurisdictional nature of the national and international marine corridors that connect the Pacific and Indian Oceans, and the need to address at a regional level the various ecological, political and economic issues that impact the region’s vital marine resources. At the same time, the RPOA and the CTI-CFF harness cooperation and collaboration to accelerate cross-learning and the implementation of best practices at local, national, and regional scales across the Coral Triangle (CTI-CFF 2013).

To support the MPA target of the RPOA, an MPA regional work plan was developed in 2010 and an MPA-Technical Working Group (MPA-TWG) was formally established in 2011. The MPA-TWG guides the regional MPA efforts under the CTI-CFF and serves as the main coordinating body on MPAs between the CTI-CFF Regional Secretariat, individual (global) partners and in-country MPA teams (CTI-CFF 2013).

The MPA-TWG members worked together over a two-year period to develop a collaborative structure and agreed approaches (*Framework*) and a roadmap of next steps (*Action Plan*) for the six Coral Triangle countries and partners to navigate these challenges through 2020. It is a foundational, not a fixed, approach to develop a functional regional MPA system and will evolve as it moves toward implementation, incorporating lessons learned and new innovations, and flexing as adaptation is recommended by the CTI-CFF MPA-TWG and approved by the CTI-CFF Senior Officials (CTI-CFF 2013).

A United States CTI Support Program financed Coral Triangle Initiative MPA Regional Exchange workshops (MPA-REX) from 2010–2013 that brought together MPA representatives from the six countries to build their collective capacity to contribute toward the regional MPA system. Through the five CTI-CFF Regional Exchanges, and four MPA TWG meetings, culminating in March 2013, the MPA-TWG invited national and international experts who formulated the *CTMPAS Framework*, established basic criteria for what constitutes effective MPAs and networks at the national and regional levels, and established a body and system to move forward the CTI-CFF MPA goal and priority actions. The focus of these regional workshops was to:

WORKSHOP 1: Establish principles, objectives, criteria and structure for CTMPAS, review status of MPA networks in each country, and propose one initial flagship site from each country for inclusion in the CTMPAS (June 2010, Thailand).

WORKSHOP 2: Review the status of MPA management effectiveness systems in each country and develop action plans for refining or establishing an MPA management effectiveness system. Identify primary criteria for MPA management effectiveness pertinent to each country (May 2011, Philippines).

WORKSHOP 3: Refine CTMPAS principles and determine objectives and criteria for achieving specific RPOA ecological, socioeconomic, and governance objectives. Determine means for creating an ecologically coherent MPA system and a structure that works across the region (March 2012, Indonesia).

WORKSHOP 4: Determine the CTMPAS structure, criteria for categories of MPAs in the CTMPAS and relevant operational processes, and develop an *Action Plan* to move the CTMPAS forward (October 2012, Philippines).

WORKSHOP 5: Finalize CTMPAS structure for implementation and determine a regionally relevant set of standards for effective MPAs as defined within the *CTMPAS Framework* (March 2013, Solomon Islands).

The collective outcomes of these workshops are represented by the substantive components of the *Framework* and *Action Plan* for creating a functional, Coral Triangle-wide MPA system.

Determination of Need

The six Coral Triangle countries determined that a region-wide system would be more efficient and effective at reducing threats across the region than approaching management effectiveness at the individual MPA site level. In addition, they agreed that the following important reasons make a compelling case for the creation of the Coral Triangle MPA System:

- Similarities in marine ecosystems, resources and shared fishing stocks in the region;
- The need to address common resource threats, for example, habitat degradation, overfishing, and dwindling fish stocks that often cross national boundaries;
- Ongoing challenges of MPAs (which are mostly small and scattered) that require learning networks, design and implementation tools, incentives, with an effective means of monitoring and improving effectiveness and ecosystem quality locally and across the region;
- Shared and interdependent sources and sinks of marine populations that support fisheries and form structural habitats for exploited species;
- Management resource sharing that creates efficiencies of scale (i.e., tap into existing programs, create economies of scale, attract funding through branding, and maximize the individual expertise of municipalities, provinces and countries); and,
- Planning at scales that consider broad ecological affinities and movements.

Design Elements of the Coral Triangle MPA System

The CTMPAS is called a “system” so as not to confuse it with the normal use of the term “network.” MPA networks are usually designed to develop ecologically connected sites and benefits for specific management objectives. Due to the expanse of the CT, it is not realistic for the CTMPAS to create an effective ecological network at that scale, at least at the first instance. Indeed, new science indicates that the distance needed for ecological connectivity is smaller than previously thought, allowing smaller areas to provide adequate ecological benefits (Green et al. 2014). However, in order to differentiate between the numerous smaller MPA ecological networks ushered directly into the regional-level program, the preferred vision or description is to consider the broader, larger area and governance of multiple networks and individual MPAs as the *CTMPA System*.

As indicated in the RPOA, the CTMPAS is intended to be inclusive of the range of MPA types that exist in the CT6. The spectrum includes large national MPAs and marine parks as well as small community-based locally managed marine areas (LMMAs). The primary criterion for inclusion is that the “MPA” is formally recognized through the means common to the country or area of concern. Such formal recognition varies from national and local laws to community agreements that constitute an accepted management regime and the relevant National Coordinating Committee’s recognition is accepted. Making the system inclusive was an important element for the six countries in providing their endorsements.

As noted, the process for formulating the *CTMPAS Framework and Action Plan* was developed by the six countries through the MPA-TWG. Three general sources of guidance were used: (1) the CTI-CFF RPOA; (2) regional dialogues and/or workshops among MPA leaders in the region and with their advisors; and (3) technical comparative reviews, studies of lessons learned, and recommendations on how to integrate fisheries management and climate change into the design of MPAs and networks as provided by various experts.

There are three major actions/steps in the CTMPAS development process: (1) Establish the CTMPAS mechanism; (2) Nominate the initial sites; and (3) Conduct early actions that operationalize the CTMPAS. Effectively, the CTMPAS serves as the umbrella under which most of these CTI-CFF MPA activities are coordinated and guided.

Goal and Vision

MPAs and MPA networks can operate at all levels, from the community and local government levels to national and regional levels. In many cases, harmony across neighboring jurisdictions of the same level, and between the various community-to-regional level managers is a critical component to success for participating MPA and MPA networks across the CT6 (White et al. 2014). After reviewing the designs and approaches of several regional MPA systems, the CT6 have agreed to adopt the following *Goal and Vision* for the CTMPAS:

CTMPAS GOAL: *comprehensive, ecologically representative, and well-managed region-wide system in place and fully functioning by 2020.*

CTMPAS VISION: *a system of prioritized individual MPAs and networks of MPAs that are connected, resilient, and sustainably financed, and designed in ways that (i) generate significant income, livelihoods, and food security benefits for coastal communities; and (ii) conserve the region’s rich biological diversity.* Note that this vision directly references language in the RPOA.

CTMPAS SHOULD INCLUDE: *most critical resources and the full range of use categories (from strict to many allowed uses).*

Ultimate targets: Twenty percent of the total marine habitat area within the CT region (e.g., coral reefs, seagrass beds, mangroves, beach forests, wetland areas, and marine/offshore habitat) will be in some form of designated protected status, with 20% (10% in the interim until 2020) of each major marine and coastal habitat in strictly protected “no-take replenishment zones” (to ensure long-term sustainable supplies of fishery resources) (CTI-CFF 2009, 2013).

Implementation Strategies

In consideration of the objectives of the RPOA, the CTMPAS framework has been designed by the TWG together with multiple representatives from each of the CT countries and will be implemented through the following five basic strategies:

Strategy 1: *Use and strengthen existing regional mechanisms, partners, programs, in developing and operating the CTMPAS.*

Strategy 2: *Prioritize activities that develop effective MPAs and networks and MPA/network sites that can immediately contribute strength or effectiveness to a regional network or system.*

Strategy 3: *Start and learn with flagship MPA sites that are already established, managed and of high conservation value. Phase-in other prioritized sites that fill regional conservation and management gaps in subsequent years or phases.*

Strategy 4: *Define and recognize four Categories of Sites in the CTMPAS: (a) Flagship Regional Sites, (b) Priority Development Sites, (c) Effectively Managed Regional Sites, and (d) Recognized CTMPAS Sites, to be inclusive of all willing sites while prioritizing some more valuable sites for management effectiveness.*

Strategy 5: *Direct Governance and Socioeconomic actions to protect Ecosystem Functions.*

Guiding Principles

Seven principles have guided the process of designing and implementing the CTMPAS. The first principle endorses the nine CTI-CFF RPOA principles that apply in general to the entire CTI-CFF process (Table 1: CTI-CFF 2013). The other principles promote inclusivity in stakeholders and social equity; integration of fisheries, climate change as well as biodiversity targets; respect for the sovereignty and national processes in the CT6 countries; and the use of science-based decision-making in an adaptive management approach.

Guiding Themes

Three reoccurring themes have shaped and will continue to contribute to the success of a comprehensive and effective CTMPAS: (1) Ecology, (2) Governance, and (3) Society. In the *CTMPAS Framework*, Ecology, Governance, and Socioeconomics are considered components of the overall system. Ecology serves as the *source* of the benefits, Governance represents the *management institutions* that have jurisdiction over shared resources and facilitate cooperative actions, and Society or Socioeconomics represents the *people* who both use the resources and are impacted by good or poor resource management. MPAs should include at least one of these components to be included in the CTMPAS. For any MPA site or network, there may be elements of one or more of these components—if a site is engaged all at once in socioeconomic, governance, and ecological networks, it is deemed to be a more effectively managed and stronger site.

Ecological Network. An ecological network of MPAs allows for the maintenance of ecological processes and ecosystem functioning, by encompassing relevant temporal and spatial scales of the marine environment. In rare instances, ecological MPA networks might develop fortuitously. Typically, they must be designed as such, so that MPA size, spacing, and placement consider the local species ecology. For example: the size of individual MPAs should be informed by the home ranges of key species; spacing of MPAs within the network should be informed by larval dispersal distances, spawning migrations and

ontogenetic shifts in habitat use; and placement should be determined by the location and distribution of habitats used throughout the species' life history (Green et al. 2013). Planning an MPA network to support holistic ecosystem functions and processes will also help to achieve local fishery goals (IUCN-WCPA, 2008; Fernandes et al. 2012). At a minimum, the CTMPAS would prioritize representative habitats, areas needed for threatened species protection, resilient sites and high-value ecological sites.

Governance Network. Governance networks comprise collaborative efforts between neighboring management institutions to manage their resources collectively or in synergy. These administrative-based networks link jurisdictions to facilitate coordination, joint actions and approaches in MPAs. A governance network ensures that management standards are equally applied, that comparable monitoring and evaluation systems are in place, and that efficiencies of scale for pooling resources, joint enforcement, accessing financing, reporting on progress, representing the CTMPAS in global events and other functions are facilitated across the network. Institutional linkages and coordination among agencies and stakeholders are a focus. Such Governance networks may include those designed for biodiversity, fisheries, climate resilience or all three combined. Importantly, governance networks can act to extend the management capacity of lower level institutions (e.g., communities, municipalities) to manage ecological processes that operate across broad spatial scales, and can lead to the formation of ecological networks (Maypa et al. 2012). For now, the MPA and related working groups, the Senior Official and Ministerial meetings and the CTI-CFF Regional Secretariat are platforms for the CTMPAS governance.

Social Network. A social network comprises people and institution-based linkages and tools to facilitate learning, engagement, and stewardship. These networks ensure that stakeholders are able to share lessons, progress, opportunities and resources, and provide guidance toward achieving economic benefits accruing to people in the system (Green et al. 2011; Varney et al. 2010). A social network continually assists in raising awareness among stakeholders and engaging them productively in the MPA network system (Figure 1). While many local governance networks perform this role, social networks within the Coral Triangle also include national learning networks (e.g., the Philippine Marine Protected Area Support Network (MSN), Solomon Islands Locally Managed Marine Areas Network (SILMMA) and the PNG Centre for Locally Managed Areas) that facilitate cross-scale knowledge-exchange between local-level managers and provincial and national organizations (Green et al. 2011).

Coral Triangle MPA System (CTMPAS) Site Selection Process

A current approach to developing MPA networks in some locations within the CT is to start with existing MPAs and later link these MPAs together in an ecological and/or governance network, adding additional sites as time, resources, and need allow. In other cases, large MPAs are designated and a resulting network is created through zones within the MPA. The result is many MPAs and a few small-scale networks of MPAs across the region (Green et al. 2011). This approach can be sub-optimal, in that it requires more area or higher numbers of constituent small MPAs to achieve regional goals, compared to a pre-planned and coordinated approach towards establishing regional networks. Eventually, both approaches are used where large zoned MPA networks are also linked to existing sets of smaller ecological or governance networks. There are no cases yet where MPA networks have been designed at a scale that covers whole countries or the region. Thus,

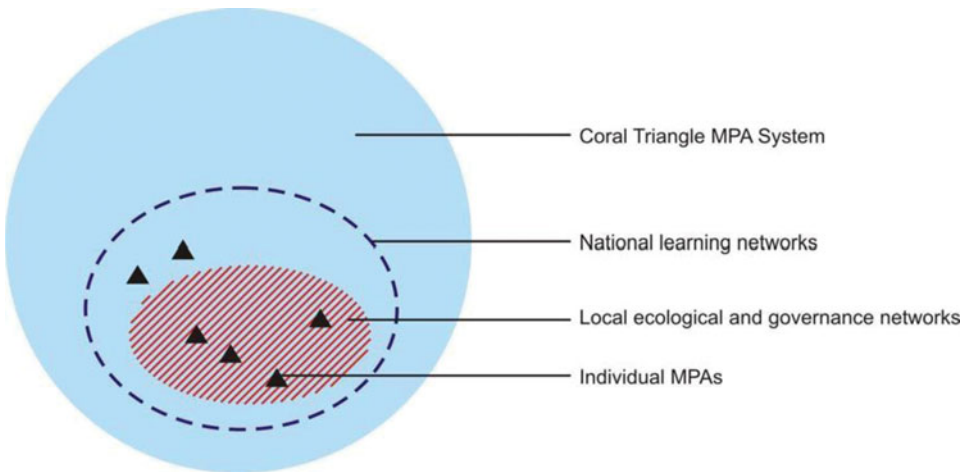


Figure 2. The CTMPAS will be composed of individual MPAs that form local ecological and/or governance networks that are nested within larger-scale social networks, such as the national learning networks. A multi-level system of nested initiatives allows for ecological connectivity processes to be managed at the appropriate scale and for social and economic benefits from management to be received by those undertaking those actions.

the development of the CTMPAS is the first step to plan for and develop a framework for all MPAs in the CT in relation to broader marine conservation objectives and human needs (Figures 2 and 3).

CTMPAS Categories

The inclusion of MPA sites and networks in the CTMPAS is based on their regional value, uniqueness, or importance, and the level of effectiveness they achieve in meeting basic criteria as MPA sites or networks as set out in the CTMPAS Framework. Four site categories will comprise the CTMPAS:

Category 1: “Recognized CTMPAS Sites”: These are sites that meet the minimum data requirements, are included in the CT Atlas and that contribute towards CTMPAS objectives at local scales. Site managers/authorities will submit their baseline information to the CT Atlas for inclusion as a Category 1 CTMPAS Site, and will be verified by the CT6 NCC as an official site.²

Category 2: “Effectively Managed Regional Sites”: These are existing sites that meet agreed minimum criteria for design and management effectiveness as specified in the *CTMPAS Framework*. Sites are nominated, reviewed and approved for inclusion in Category 2 by each country’s National Advisory Committee or equivalent body based on a national management effectiveness system if it exists, and the criteria set out in the CTMPAS (e.g., DCAFS 2012; MSN 2011). The national decision process may vary among countries, but MPAs accepted into Category 2 should at least achieve the minimum criteria specified in CTMPAS and recognized as contributing toward CTMPAS objectives at national and regional scales.

Category 3: “Priority Development Sites”: These are sites of regional ecological, governance, or socioeconomic importance that are not yet effectively managed and thus

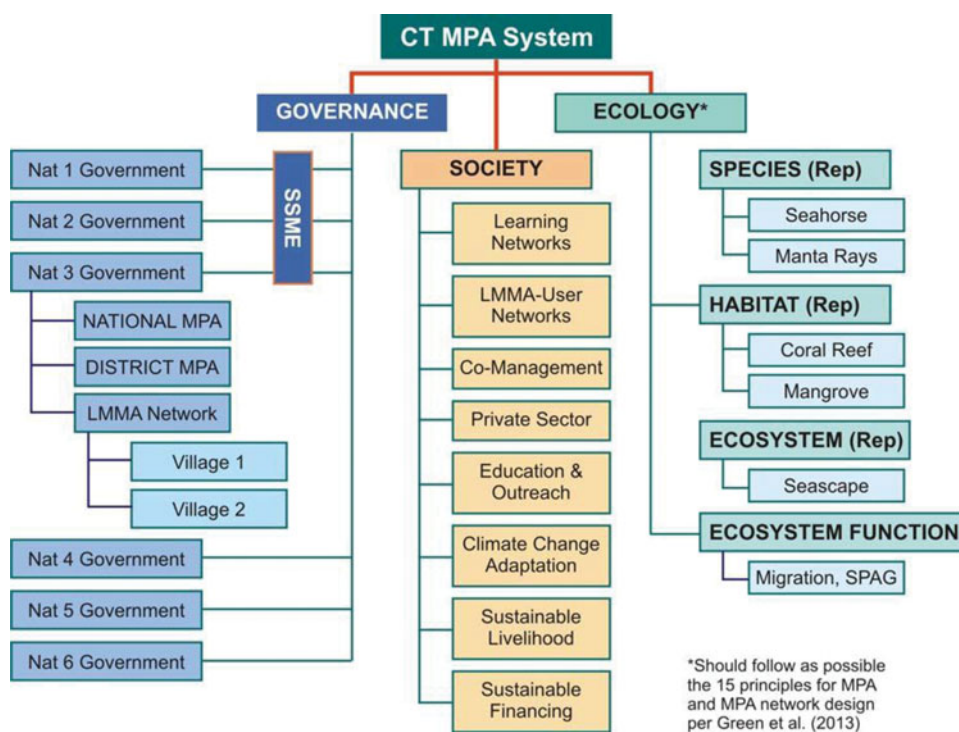


Figure 3. Framework: Ecology, governance, and social network structures in an MPA system (CTI-CFF 2013).

may need additional assistance or experience, or new sites added to the system, as recommended by the regional gap analysis. Similar to Category 4, these sites should be of regional importance and contribute to the CTMPAS objectives. Priority Development Sites will be nominated by their National Advisory Committee and will be reviewed and approved by a regional CTMPAS Advisory Committee.

Category 4: “Flagship Sites”: These include large, already effectively managed sites that have exceptional regional ecological, governance or socioeconomic importance. These are “no-regret sites” that the regional CTMPAS Advisory Committee agree are important within the system. Flagship sites are nominated by their host country, and will be reviewed and approved by a regional CTMPAS Advisory Committee.

The CTMPAS will thus include all recognized MPAs and networks within the Coral Triangle region, qualified by level of accomplishment, contribution, and purpose of the site(s). The *Framework* states that the countries should select MPAs under Categories 1 and 2 based on their own internal management effectiveness monitoring system and the criteria set out in the *CTMPAS Framework*; these nominations would be simply verified for acceptance by the Regional Advisory Committee. National Committees would also nominate sites for Categories 3 and 4; however, these must be reviewed and accepted by the CTMPAS Regional Advisory Committee working with the MPA-TWG (Figures 4 and 5).

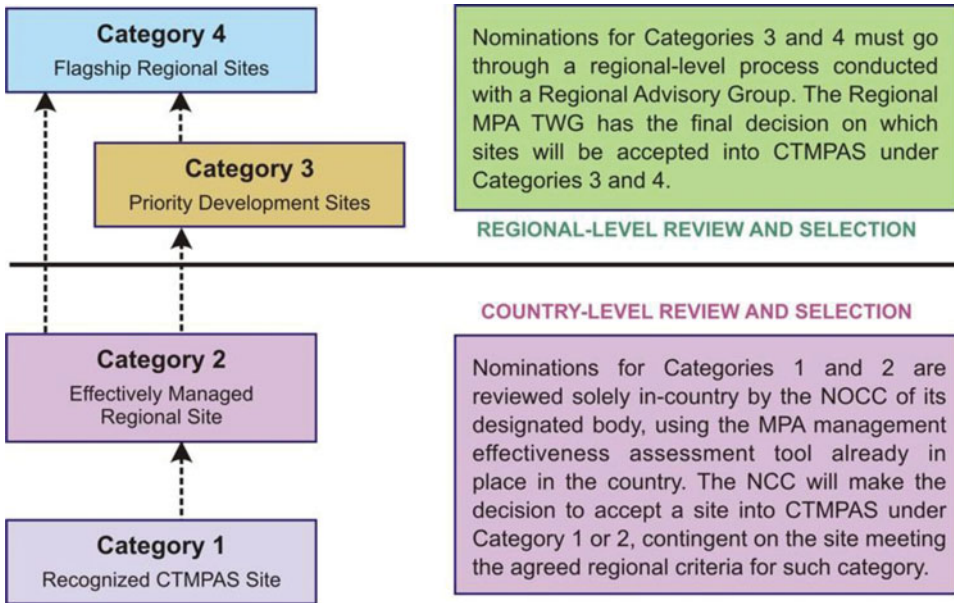


Figure 4. Site categories for CTMPAS inclusion. All sites with the basic information required to be recorded in the CT Atlas can be Category 1. The arrows show potential movement pathways to others categories, all of which depend on the qualifications of a site with the CTMOAS relative to the criteria for each category (CTI-CFF 2013).

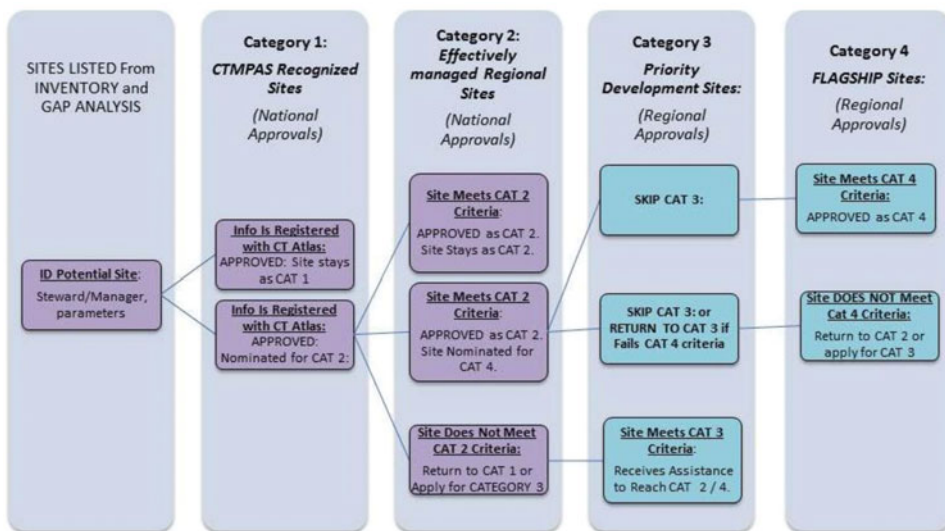


Figure 5. CTMPAS site nomination and approval process. Purple Boxes/Category 1 and 2 MPA Sites or Networks require only Nationally Nomination and Evaluation; Blue Boxes/Category 3 and 4 MPA sites or networks require National Nomination and Regional Review/Evaluation and Approval (CTI-CFF 2013).

Staged Development of CTMPAS

The CT6 recognize that the development of the regional CTMPAS is a long-term undertaking (the target is 2020) and that it will continue to evolve in the decades ahead as national and transboundary MPA systems develop. None of the CT6 has fully developed their MPA systems but strong initial steps have been made in all countries, and existing capacity is ready to begin looking at a regional scale for national and regional links and benefits. The CT6 have already prioritized geographic areas as national priorities to contribute to the CTMPAS. Many other sites include pilot MPAs and MPA networks and activities to link conservation, fisheries and climate resilience/adaptation objectives to appropriate partners for support and advice (CTI-CFF 2013).

Initial Phase. In order for the regional system to move forward, each CT country will initially nominate to the CTMPAS between one and five national sites drawn from their existing priority geographies, established MPAs and “flagship” sites. These sites will typically be marine parks with several no-take and other zones that form part of a network. By beginning with a few, strong, well-supported MPA sites, the CTMPAS can establish holistic administrative and structural approaches that can accommodate the full range of country sites and MPA types as it develops. This phase also allows the countries to take advantage of shared experiences and practices, adapt national guidance early in their own development, and to select regional standards and conservation targets for the CTMPAS.

Subsequent Phase(s). Using the conservation and management priorities identified in the ongoing regional gap analysis,³ a second cohort of Category 4 “flagship” and Category 3 “development” CTMPAS sites can be nominated for review and inclusion in 2014 and thereafter. Nominations will be repeated either until targets and objectives are met, or indefinitely as conditions, scientific information and needs change.

Site Selection Process

As shown in the above conceptual framework (Figure 4), there are two levels of site review and selection:

1. At the **country level**, a designated body (e.g., NCC or a MPA Advisory Committee) will select sites that meet the regional criteria for each of the four CTMPAS categories. For Category 1 and Category 2, each country will select the sites based on their own rating system and the agreed regional criteria for such category; the required data attributes for selected sites are then submitted to the CT Atlas for inclusion in the CTMPAS database. For Category 3 and Category 4, country nominations should also be submitted to the MPA-TWG for further evaluation and approval/acceptance. Any site nominated for Category 3 or 4 must already have minimally qualified as Category 1 (and included in the CT Atlas) as a prerequisite.
2. At the **regional level**, the MPA-TWG in consultation with a designated CTMPAS Regional Advisory Committee made up of external, independent experts will use an agreed set of regional criteria to review and accept sites that have been nominated by the countries. Also at the regional level, the MPA-TWG may recommend sites for nomination to the concerned countries for Category 3 or Category 4 that have not already been nominated, these sites having been determined by the TWG and Advisory Group as having regional significance, or the potential to be regionally

significant. The ultimate approval and decision-making power rests with the MPA TWG which is comprised of the CT6 representatives.

For an MPA to be included in the CT Atlas database as a recognized CTMPAS site under **Category 1**, it should pass an in-country selection process and have at least the core (minimum) data attributes as identified in the *CTMPAS Framework* (CTI-CFF 2013). Sites must remain current in the CT Atlas for the core data attributes, but no additional nomination or reporting requirements for this level are required.

Nominations for Categories 2, 3, and 4 will be evaluated by rating the sites against the criteria for Categories 2, 3, and 4. The process for all categories is described above.

The selection of sites for **Category 2** will be done in-country, that is, the countries will each determine which of their MPAs will be included in Category 2, using their respective national MPA rating systems and management effectiveness assessment tools where such exist and the agreed regional criteria for Category 2. For example, Indonesia and the Philippines have national systems for evaluating MPA management effectiveness that are acceptable for determine category 2 status of MPAs (DCAFS 2012; MSN 2011).

To be accepted under Category 3 or 4, a site must be formally recognized and endorsed by the country and must pass a regional review. **Category 4** requires a high level of management effectiveness as well as regional importance. **Category 3**, on the other hand, does not require a high level of management effectiveness but focuses mostly on the relative level of regional importance of an MPA or MPA network as a “Priority Development Site.” This designation will likely trigger joint or leveraged resources and actions among the CT6. Each nomination is rated by assigning points to each CTMPAS Framework criterion to achieve a minimum number of points (CTI-CFF 2013).

This rating system will be used by the Regional Advisory Committee and MPA-TWG for all nominations. Sites may be downgraded in the CTMPAS if they no longer meet the criteria for their level, or if they fail to update their data in the CT Atlas.

Indicators and Results for Tracking Progress

The CT6 have defined a core minimum set of indicators to track progress toward Goal 3 of the RPOA and are committed to achieving the overall target of 20% of the total marine habitat areas included in the CTMPAS (see Table 3: White et al. 2014). In addition achieving the indicators, over the long term, the results or **outputs** of the CTMPAS are expected to include:

- **A commitment from nations**, MPA Sites and impacted society to contribute to, learn from, and follow good practices;
- **A coordination mechanism** for the CTMPAS nested in CTI-CFF organizations, guided in part by the MPA-TWG, and including a coordinator and information-sharing platform;
- **A living *Framework and Action Plan*** for the CTMPAS that is revised as needed every 5–10 years with new goals, targets, actions, members, and work plans;
- **Biannual Reports** submitted to the CTI-CFF organization by the CTMPAS sites through their national representatives based on a common set of information on the status of each site’s ecological, governance, and social aspects. Reporting may be assisted by the use of an agreed set of templates designed to reduce the reporting burden.

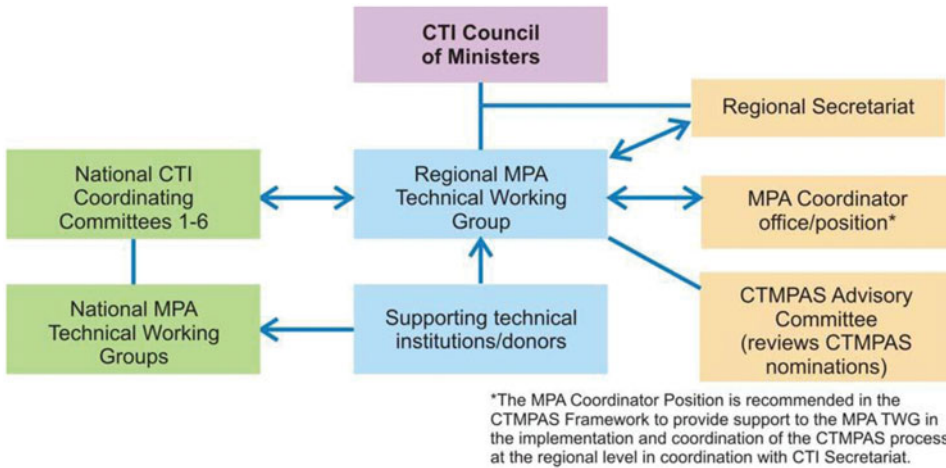


Figure 6. Illustrative organizational structure of CTMPAS.

- **A set of well-managed MPA sites** in the CT6 that contribute to the CTI-CFF regional ecological objectives (connectivity, resilience, representation, etc.) and at the same time provide sustainable livelihoods to local communities and stakeholders;
- **An annual set of priority activities** coordinated by the CTMPAS mechanism, supported by the CT6, communities and partners, and designed to strengthen the CTMPAS as a whole and the CTMPAS sites individually to meet CTI-CFF objectives;
- **Representation of the CTMPAS** in other international forums to inform, advocate, coordinate and learn with other regional organizations and thus help achieve the CTMPAS objectives; and
- **An active communication program** that links implementers within the CTMPAS and enables them to work smarter, informs the public sector on the benefits they can receive from and the actions they can take to contribute to the success of the CTMPAS, and presents the CTMPAS to the local, national, regional and global community as a case study and partner in sustainable conservation.

This *CTMPAS Framework and Action Plan* is designed to facilitate and guide the CT6 and their partners as they work towards achieving these measurable indicators and objectives.

Implementation of and Institutional Structure for the CTMPAS

The CTMPAS is considered to be an open-ended and long-running program through 2020 and beyond. As a part of the decentralized CTI-CFF, the system may involve up to three complementary institutions that have major roles in its implementation, and in particular the implementation of the CTMPAS. Each of the institutions listed below will have a part to play in its operations, policy development, and technical leadership (Figure 6).

CTI-CFF Regional Secretariat—The CTI-CFF Regional Secretariat is the official institutional home for coordination of the CTI-CFF and thus provides support to the MPA-TWG which guides the CTMPAS. The Regional Secretariat is the overall clearing house for all CTI-CFF matters and thus has a mandate to support the CTMPAS as a major CTI-CFF program. It will assist coordination between the

CTMPAS and the other sectors of the CTI-CFF. It will help link MPA information and planning with general CTI-CFF planning and reporting cycle and facilitate the incorporation of fisheries, seascapes, climate change and threatened species linkages with CTMPAS. The CTI-CFF Regional Secretariat is also responsible for facilitating tracking progress toward the goals and indicators of the RPOA.

MPA-TWG—The MPA-TWG serves as the steering and oversight committee for the design, development and operation of the CTMPAS and its regional level activities, including fundraising. The MPA-TWG reviews, recommends and reports on the CTMPAS to the Council of Senior Officials through the Regional Secretariat. It liaises regularly with the National Coordination Committees (NCCs), other thematic TWGs, and supporting partners and will provide direction to a CTMPAS supporting institution (if and when established) and any science advisors. The MPA-TWG meets at least once a year to perform its functions of reviewing nominations to the CTMPAS and providing overall guidance to the CTMPAS operation.

Supporting Institution or Individuals—Although it is recognized that most of the operations of the individual MPAs and networks will be overseen by local managers and the NCCs and agencies, the CTMPAS needs institutional support for its daily operations, activities and coordination as it develops and operates. The MPA-TWG recommends seeking a partnership with an institution or individuals with regional MPA expertise that will report directly to the MPA-TWG. The supporting institution or individuals will handle the routine and technical operational tasks, coordination and other secretariat functions of the CTMPAS, specifically the following primary functions: (1) Coordinate and support the internal and technical operations of the CTMPAS; (2) Seek and facilitate funding; and (3) Coordinate/liaise with other CTI-CFF bodies and MPA-related international forums on CTMPAS matters. Internal and technical tasks could include:

- Maintaining an updated distribution list,
- Coordinating with the CT Atlas team on the MPA database and related tasks,
- Routine correspondence with all CTMPAS members and the Web portals,
- Sharing news updates and an events calendar,
- Hosting the MPA Joint Workspace and conference calls,
- Preparing for regional exchange workshops,
- Supporting the MPA-TWG,
- Coordinating regional level activities with countries and partners, and
- Compiling CTMPAS management effectiveness monitoring data into periodic progress reports directed at the individual MPAs, CT-6 national governments, the Regional CTMPAS Advisory Committee, the CTI Secretariat, and donors.

The supporting institution or individuals may represent the CTMPAS outside of the CTI-CFF upon the instruction of the MPA-TWG Chair.

CT6 National Coordination Committees (NCCs)—The NCCs are responsible for developing, strengthening, and operating their own national MPA systems as well as any of the sites or programs that they contribute to the CTMPAS. Their functions may include recruiting MPAs to join local and national networks and register with the CT Atlas, validating national MPA members of the CTMPAS, and developing support programs that provide local- and higher-level benefits. The NCCs represent their national MPA system and any CTMPAS-designated sites to the regional CTMPAS both directly and

through the MPA-TWG. NCCs should develop and facilitate financial and program support to strengthen their domestic MPA programs.

Regional Advisory Committee—The MPA-TWG will need expert review, analyses, and inputs from technical experts on emerging or adaptation issues relating to the development and operation of the CTMPAS. The primary task of the Advisory Committee will be to review national site nominations to the CTMPAS. The Regional Advisory Committee was selected and approved in November 2013 by the CT6 Senior Officials.

Partners and Other Collaborating Organizations—Partners and other collaborating organizations can support and benefit from the CTMPAS by providing technical and advisory services and funding, leveraging contributions or in-kind services, and other means. The MPA-TWG, the six NCCs, their partners and other collaborating organizations will work with the Regional Secretariat to adopt short-term (one-year), medium-term (1–2-year), and long-term (2020) roles and tasks in support of the CTMPAS at national and regional levels. In addition to the seven founding CTI-CFF partners (Australia, United States of America, Asian Development Bank, UNEP/Global Environment Facility, Conservation International, The Nature Conservancy and the World Wildlife Fund), key partners will include:

- *CT Atlas Team*: This program is presently located in WorldFish in Penang, Malaysia and is assisted by The Nature Conservancy. It operates an on-line database with analytical tools and geographic information systems (GIS)—mapping capacity and currently holds the location and some status information on MPAs in the region, with the objective of compiling information on all the approximately 1,900 MPAs so as to support decision-making in the CT6. The CTI-CFF and CTMPAS are working out a long-term arrangement with the CT Atlas for hosting the CTMPAS database, information and analysis system.
- *CT MPA Learning Network*: The CT MPA Learning Network, presently supported by the Coral Triangle Center (CTC), will partner with the CTMPAS team in sharing and conducting outreach, developing and conducting MPA applied research and training for CTMPAS sites and counterparts, and solidifying its existing role in information-sharing and cross-learning on MPA in the CT with clearer and more specific tasks related to the CTMPAS.
- *Other MPA networks and organizations*: There are several other MPA networks, systems, and supporting institutions presently operating in the CT region that the CTMPAS can learn from and exchange information and collaborate with. These include national networks such as the LMMA Network (Asia and Pacific), MSN (Philippines), PNG Center for Locally Managed Areas (CLMA), Solomon Islands LMMA (SILMMA), and other organizations such as the International Union for Conservation of Nature (IUCN), CTC, ASEAN Center for Biodiversity (Philippines), and the TWGs supporting the Sulu-Sulawesi Marine Ecoregion and Bismark-Solomons Seas Ecoregion (BSSME), among others.

Financing the CTMPAS

As a regional initiative under the RPOA, the CTMPAS operations and programs will likely be supported by financing from multiple sources. Options include but are not limited to:

- Funds committed by the CT6 to the regional operational mechanisms and to national MPAs and networks,
- Grants and loans from donors,

- In-kind assistance and grants from nongovernmental organizations (NGOs) and private parties,
- Partnerships with the private sector,
- In-kind contributions from participating or hosting NCC and agencies, and
- In the future, a sustainable finance mechanism such as a revolving fund from membership fees or similar revenue streams.

Building the CTMPAS System

The creation Of the CTMPAS requires several steps or phases that are either currently underway or projected to occur within 1–3 years of the system’s initiation. These steps, part of the Action Plan within the CTMPAS Framework as determined by the CT6, include:

- Build the system of sites to populate the four categories of the CTMPAS
 - Recruit and evaluate nominations for Categories 3 and 4 sites and process the inclusion of all sites in Category 1 during 2013–2014 as described in the *CTMPAS Framework*.
 - Proceed with annual nomination of sites according to the agreed criteria and process.
 - Work to fill system gaps based on analysis of regional conservation gaps and national MPA network planning processes.
- Build the administrative platform
 - Solicit proposals for and select a home operational and coordination institution
 - Finalize coordinator/institution and assign tasks
 - Strengthen agreement and working arrangement with CT Atlas
 - Define least cost and most effective tasks and reporting system
- Build the CTMPAS and coordinate with other programs
 - Define common needs (e.g., training) or regional needs (e.g., outreach to international forums)
 - Source funding support for “Priority Development Sites” once nominated
 - Develop annual program plan to address needs and assign responsibilities
 - Coordinate with other regional MPA programs

The CTMPAS will require various supporting activities to become a viable, long-term program of the CTI-CFF. Selected activities that are either ongoing or anticipated include:

- Conduct of regional exchanges at least once a year on specific hot topics or tools and to review overall progress in CTMPAS implementation and its procedures
- Best practices teams that define and promote management effectiveness or introduce new tools at national sites of regional interest/value
- Outreach, monitoring, and learning/sharing among partners, sites, and programs
- Annual report cards on status of the resources and management effectiveness
- Regional training programs that build capacity
- Scientific studies on the ecosystems and their changes over time
- Facilitation of training and graduate degrees
- Social and economic studies of impacted human communities, their changes over time, and correlation to effective management of MPAs

For all practical purposes, the CTMPAS is the umbrella under which most CTI-CFF MPA activities come together, are coordinated and guided.

Conclusion

The endorsement of the *CTMPAS Framework* and Action plan by the six Coral Triangle countries is a progressive and important step towards the establishment of a regional-wide MPA system using common definitions and means of tracking progress. A major outcome of the *CTMPAS Framework* is that for the first time, the six countries together have adopted a consistent and scientifically robust set of criteria and indicators by which the effectiveness of MPAs and MPA networks across the region can be judged. In this manner, it will be possible to know more accurately and systematically to what extent the objectives for marine conservation in the region are being achieved. This is important for decision-makers at the local, national and regional scales to help them better allocate resources targeted for marine conservation and marine resource management in the Coral Triangle region, as well as for other initiatives such as, for example, the Caribbean Challenge and Micronesian Challenge. The CTMPAS is the first regional system of its kind and deserves the support required to make it effective for stakeholders and the globally important biodiversity in the Coral Triangle.

Having said that, the long-term sustainability of the CTMPAS framework is incumbent on continued support and engagement of the CT6 countries, and a demonstrated willingness of the governments of these countries to provide the support mechanism, including capacity building, to ensure MPAs within their counties meet the requirements of the CTMPAS.

Additionally, adequate funding, support and political will by each of the countries is necessary to maintain the CTI-CFF institutional structure on which the success and sustainability of the CTMPAS framework is dependent. Finally, the CT Atlas is the depository of data sets that pertain to basic information about MPAs in each of the six countries, as well as an online organizing mechanism for continuous evaluation of the management effectiveness of each of the MPA sites and thus progress at national and regional scales. The CT Atlas needs to remain a current and relevant support tool for the CTMPAS framework to become functional and flourish in the future.

The biggest challenge that remains is that the CTMPAS is comprised of both individual and networks of MPAs across a vast and varied region. The size, scope, jurisdictional authorities, management frameworks, management objectives, and institutional structures and support mechanisms run the gamut. Although the CTMPAS was never intended as a framework to create alignment, and in fact wants to recognize and honor the differences in MPAs, it opens up the possibility that those sites with the greatest capacity, technical and financial resources, are most likely to be active participants in and gain the greatest benefits from participating in the CTMPAS. The CT6 and all the partners in the CTI-CFF move forward with this awareness and are mindful about the importance of providing opportunities and mechanisms for all MPAs in the Coral Triangle to be recognized and given the opportunity to participate in the CTMPAS. An important outcome of the CTMPAS will be that the lessons from progressive sites and management success can be shared across the region so that the status quo is elevated.

Acknowledgements

The database and maps referred to can be accessed at <http://ctatlas.reefbase.org/>. The Interim Regional Secretariat of the Coral Triangle Initiative on Coral Reefs, Fisheries and Food Security (<http://www.coraltriangleinitiative.org>) is thanked for overall support for development of the Coral Triangle MPA System Framework through the cooperation of the six Coral Triangle Countries.

Funding

Funding for the preparation of this document was provided by the USAID-funded Coral Triangle Support Partnership (CTSP) through the USAID Project: GCP LWA Award # LAG-A-00-99-00048-00. Disclaimer: This document is made possible by the generous support of the American people through the United States Agency for International Development (USAID). The contents are the responsibility of Coral Triangle Support Partnership (CTSP) and do not necessarily reflect the views of USAID or the United States Government.

Notes

1. The CT Atlas is the official information system and spatial database for tracking progress in the CTMPAS. The data requirements for Category 1 are set out in the CTMPAS Framework and agreed among the countries through data sharing agreements with WorldFish, the institution in Malaysia that manages the CT Atlas.

2. An initial gap analysis has been conducted by the University of Queensland and other researchers (Beger et al. 2013) which is the first systematic, CT wide, gap analysis for marine conservation.

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