CORAL TRIANGLE INITIATIVE

State of the Coral Triangle Report HIGHLIGHTS

INDONESIA

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Executive Summary

Divers from The Nature Conservancy monitoring coral reefs in Rajah Ampat. Credit: TNC

Biophysical Resources

Indonesia is the world's largest archipelagic state, covering 5,120 km from east to west and 1,760 km from north to south and divided into several shallow shelves and deepsea basins. Shelves found on the west are connected to the Asian continent (Sunda Shelf) and on the east to the Australian continent (Sahul Shelf). Located on the equator, the country's climate is almost entirely tropical, with temperature in coastal plains averaging 28°C and relative humidity ranging from 62–81%.

The Indonesian Through Flow (ITF) also influences the entire global climate system. The eastern part of the Indonesian archipelago plays an important role in water mass transport from the Pacific to the Indian Ocean, referred to as the (ITF) or Arlindo (*Arus Lintas Indonesia*) in Bahasa Indonesia. The region is recognized as a primary energy source for the entire global circulation system The Indonesian region is considered a "maritime continent" along with equatorial Africa and South America.

Indonesian **coral reefs** constitute the largest coral reef area in Southeast Asia with an estimated area of about 51,000 km^2. In 2008, these coral reefs were in varying conditions: excellent, 5.48%; good, 25.48%; fair, 37.06%; and poor, 31.98%. There are 13 species of seagrasses currently recorded in Indonesia, covering an area of at least 30,000 km^2 throughout the archipelago.

Mangrove forests account for 76% of the total mangroves in the Southeast Asian region and form the coastal vegetation in Sumatra, Kalimantan, and West Papua. The country's mangrove forests have been estimated to cover an area of 35,337 km^2; many reports have identified at least 101 mangrove-associated species.

Governance

Indonesia's 1945 Constitution provides the foundation for marine resource management in Indonesia, stating that, *"Land and water and natural resources therein shall be controlled by the State and shall be utilized for the greatest benefit of or welfare of the people."* The basis for national marine policy lies in the 2010-2014 *National Medium Term Development Plan*, which includes policies on fisheries, marine environment, forestry, small island development and management, marine tourism, mining, and sea transportation. No Indonesian law or regulation specifically addresses the use and management of coral reef resources; instead, conservation and management of coastal and marine resources are regulated by a group of 17 natural resource laws and regulations.

Governance of coastal and ocean resources in Indonesia is the shared responsibility of various agencies under the state ministries. Overall responsibility for the management, development, and conservation of fisheries and other coastal and marine resources lies within the Ministry of Marine Affairs and Fisheries (MMAF), while coastal environmental protection and management is the responsibility of the State Ministry for Environment (SMT) and the Ministry of Forestry (MOF).

Enforcement of Indonesia's laws on coastal and ocean resources management is a joint responsibility of several national government institutions led by MMAF and MOF. These ministries, together with the SMT, Ministry of Communication and Transportation, Directorate General of Immigration, Directorate General of Customs, Indonesian Navy, and Indonesian

Key Statistics

BIOPHYSICAL	
Archipelagic extent	5,120 km (E to W) and 1,760 km (N to S)
Total area of national jurisdiction	7.7 million km^2
> Archipelagic waters	2.8 million km^2
> Territorial waters	0.3 million km^2
> Exclusive economic zone	2.7 million km^2
> Land area	1.9 million km^2
Total coral reef area	51,000 km^2
Total mangrove area	35,337 km^2
Total seagrass area	30,000 km^2
SOCIO-ECONOMIC	
Population (2010)	238 million
Fish consumption per capita	19 kg
Fish to protein consumption	60%
Total landed catch (2010)	5,384,740 tons

Fisherman from Central Sulawesi. Credit: Permana Yudiarso

Police (Marine Police), act as "civil investigation officers" (*Penyidik Pegawai Negeri Sipil* [PPNS]), with functions that include monitoring, control, surveillance (MCS) and law enforcement. The Triangle Integrated Environmental Criminal Justice System was introduced as a model to address problems in the investigation and prosecution of fisheries crimes. There are still some traditional marine resource management systems being practiced in some areas of Indonesia: *Sasi* in Moluccas and Papua region, *Panglima Laut* in Aceh, *Awig-awig* in Lombok, and *Mane'e* in Sangir and Talaud Islands, North Sulawesi.

Socio-economic Characteristics

Indonesia was administratively divided into 33 provinces, subdivided into 399 districts, 98 municipalities, 6,487 subdistricts, and 76,613 villages. All provinces and more than 80% of the districts and municipalities have coastal areas. Indonesia is home to many cultural communities, with over 300 ethnic groups. Jakarta, the capital city, is located on the island of Java. The Javanese comprise the largest ethnic group, making up 41% of the total population, followed by the Sundanese, Malays, and Madurese. Minor ethnic groups are found in Kalimantan and Papua. In 2010, the total population of Indonesia was placed at 237.6 million, mostly concentrated in Java Island.

In 2010, the **capture fisheries industry** of Indonesia produced 5,384,740 tons (t) valued at Rp64.5 trillion. Of this total, marine capture fisheries production was valued at Rp48.8 trillion and open water capture at Rp. 4.3 trillion. The Government established 11 fishery management areas (*Wilayah Pengelolaan Perikanan* (WPP) covering the Indonesian territorial sea and exclusive economic zone (EEZ).

About 50% of Indonesia's fish production comes from **aquaculture**, which has grown significantly from 2.1 million tons in 2005 to 4.7 million tones in 2009. The strategic geographic position of Indonesia provides advantages for the **shipping industry.** Indonesia borders the Straits of Malacca, one of the most strategic and important shipping lanes in the world, connecting the east and the west and providing a key link in maritime trade. The Straits carry half of the world's oil supplies and a third of world trade. Indonesian's oil reserves represent about 1% of total world reserves.

Women play a crucial role in coastal resource management (CRM) activities in Indonesia. There is no evidence of women being involved in activities related to the degradation of the natural resources, but instead these degradation adversely affects women's health and livelihood.

The **payment for ecosystem services (PES)** scheme has been adopted in Indonesia in recent decades. It is mostly used in biodiversity conservation, watershed protection, carbon sequestration, and landscape/seascape beauty. The legal basis of PES in Indonesia is found in several enactments, including laws providing for the use of PES for water management, forest utilization, environmental services, and the utilization of natural resources such as fisheries.

Several **programs for the rehabilitation and restoration of coastal ecosystems** have been implemented in Indonesia in the last 15 years. The ADB and World Bank-funded Coral Reef Rehabilitation and Management Project (COREMAP), launched in 1998, is one of the largest programs in marine environment rehabilitation in Indonesia.

Threats and vulnerabilities

Overexploitation of marine resources is widespread in Indonesian waters, with many fish stocks exploited well beyond biological limits. Indonesian fishers and foreign fleets continue to overexploit the Indonesian fisheries. In addition, there is a live reef fish trade that primarily targets groupers, Napoleon wrasse and barramundi cod.

The severity of **biodiversity depletion** in the country in the last few decades has been evidenced by the rareness or extirpation of many coastal and marine species (sea turtles, giant clams and some other mollusc species, crustaceans, cetaceans, dugong, and humphead wrasses); the destruction of critical coastal habitats, particularly mangroves and coral reefs; and over fishing.

Almost all **domestic sewage** in Indonesia is discharged directly to the sea, or indirectly through rivers, without proper

Indonesian youths release baby turtles into the ocean during a campaign to save sea turtles on Lampuuk beach in Aceh Besar. Credit: AP

treatment. The low level of sewage treatment has led to high organic and nutrient loading, resulting in eutrophication manifested by red tides and harmful algal blooms (HAB) in many places.

Indonesia is highly vulnerable to **climate change impacts** affecting development of the marine environment, fisheries, and other sectors. Sea surface temperature anomalies have caused massive coral bleaching in most Indonesian waters.

Invasive Alien Species (IAS), though less well-documented, is another threat to biodiversity in Indonesia. The IAS phenomenon has been occurring in Indonesia for a long time with great negative impacts on several ecosystems.

CTI National Plan of Action

The five goals of the Indonesian CTI include improving the governance and effective management of the priority seascapes, ecosystem-based approach to fisheries management (EAFM), improving management of marine protected areas (MPAs), climate change adaptation, and improving the conservation status of threatened species.

Goal 1: Priority seascapes designated and effectively managed. Of the 12 marine ecoregions, Indonesia has six seascapes (Bird's Head of Papua, Anambas-Natuna-Karimata [*Bastunamata*], Tomini Bay, Banda Sea, Halmahera Sea, and Lesser Sunda), which have been prioritized for management in the period, 2010-2014. The Government of Indonesia will also implement the integration between the seascapes program and the Indonesia Fisheries Management program in the same seascapes during this period.

Goal 2: EAFM applied. The four targets of EAFM include: (i) strong legislative, policy, and regulatory frameworks in place for achieving EAFM; (ii) improved income, livelihoods, and food security of an increasingly significant number of coastal communities across the region through the Sustainable Coastal Fisheries and Poverty Reduction Initiative (COASTFISH); (iii) effective measures in place to help ensure sustainable exploitation of shared tuna stocks, with tuna spawning areas and juvenile growth stages adequately protected; and (iv) a more effective management and more sustainable trade in live reef fish and reef-based ornamentals achieved. Although not all targets have been reached from 2010-2012, significant results have been achieved in this period.

Goal 3: Improving management of MPAs. The main target of this goal is the implementation of the region-wide Coral Triangle MPA System (CTMPAS). The actions that have been planned by the Government of Indonesia to achieve this target are: (i) establishing and strengthening the national strategy of MPA and transboundary protected areas through collaboration with related neighboring countries, e.g., through the Sulu Sulawesi Marine Ecoregion (SSME); (ii) improving the planning and management of MPAs to address local and global threats; (iii) enabling policy and institutions for MPAs; and (iv) building institutional capacity for managing MPAs and ensuring sustainability of funds for MPAs. Most of the actions that have been taken by Indonesia from 2010-2012 include the following: (i) strengthening of Savu Sea National Marine Park management; (ii) designation of the new Anambas National Marine Park (1.2 million ha); (iii) strengthening the national capacity for MPA management through the establishment of technical implementation units and the initial management body responsible for the management of eight national MPAs; and (iv) other actions related to MPA management.

Goal 4: Climate change adaptation. There are two targets for the climate change adaptation goal: (i) regionwide early action climate adaptation plan for the nearshore marine and coastal environment developed and implemented; and (ii) networked national centers of excellence on climate change adaptation for marine and coastal environments established and in full operation. Several actions have been planned to achieve these targets. These include the following: (i) identification and mapping of the Indonesian CT areas for their susceptibility to climate change impacts; (ii) producing national guidelines for adaptation to the impact of climate change on marine and coastal ecosystems; (iii) formulating an early warning system and response to weather variability, temperature variability, and changes in storm phenomenon; and (iv) conducting strategic research to provide information critical to reducing key threats to coral reef ecosystems. Some collaborative researches on the impact of climate change on marine and coastal ecosystems have been conducted from 2010-2012.

Goal 5: Improving the conservation status of threatened species. The main target is to improve the conservation status of sharks, sea turtles, seabirds, marine mammals, corals, seagrasses, and mangroves. Several actions have been planned to achieve this objective, namely: (i) conducting an assessment of sharks, sea turtles and cetaceans, and selected marine invertebrates and plants; (ii) strengthening the implementation of CITES through the management and scientific authorities; (iii) implementation of the National Plan of Action for shark conservation and management and enforcement of *Ministerial Regulations on Napoleon Wrasse*. Some actions have been conducted from 2010-2012, including (i) mapping of the distribution of sharks as basis for the limited protection of this species; (ii) development of guidelines for the supervision of protected fish species; and (iii) mapping and determination of the potential for the trade of ornamental corals.

Linking the NPOA/RPOA to the establishment of sustainable fisheries and food security

Lack of capacity at the national, regional, and local levels for biodiversity conservation and sustainable use is the main constraint to sustainable marine and coastal development in Indonesia. The MMAF, together with some international NGOs (CI, WWF, and TNC), have conducted several trainings on the management of coastal and marine ecosystems in Indonesia, such as training of practitioners, site-based trainings, training for MPA managers, MPA learning network, and developing the School for Marine Resources Conservation and Management. Through capacity building and institutional development, coastal and marine governance fundamentals have been established to apply and integrate EAFM in MPA management. Together with the CT-MPAS, MPA networks, and the SSME, these contribute to scaling up actions and pave the way towards sustainable fisheries.

To address the problem of **irregular and inadequate government funds to cover MPA operating expenses**, *Government Regulation 80/2011 on Trust Funds* has been enacted, mandating the development of trust funds to finance biodiversity conservation in Indonesia. The Sustainable Financing Working Group (SFWG) for MPA Management was established in 2011. The SFWG was established under the leadership of MMAF and consists of MOF, Ministry of Finance, State Ministry of Environment (KLH), *BAPPENAS*, and some international NGOs. The main function of this working group is to develop instruments of financial sustainability and other working procedures. Incentives and disincentives need to be put in place to plow back revenues and equitably allocate costs and benefits that will redound to helping stakeholder incomes. Assuring savings and proper spending patterns can facilitate access and availability of food to the poorest of the poor.

Women working in a nursery used to grow mangrove seedlings, Limbatihu, Gorontalo, Sulawesi, Indonesia.
Credit: Matthew Oldfield

Priority Research Issues

- ☑ Effective management of MPAs and coral reef restoration initiatives
- ☑ Study on Marine Invasive Species, coastal pollution and HAB occurrence
- ☑ Climate change impacts on marine ecosystems, biodiversity, and coastal communities especially on livelihoods and the role of women
- ☑ Valuing impacts of resource degradation on livelihoods and health of women
- ☑ Genomics (marine biotechnology) study on marine biodiversity protection
- ☑ Socio- economic aspects for revitalization of traditional knowledge management on coastal resource utilization

A **lack of public awareness of the marine and coastal environment and the value of biodiversity** is another bottleneck for sustainable coastal development in Indonesia. Many programs and projects are, therefore, investing in awareness and education initiatives with focus on marine and coastal resources and the environment. To date, a number of such initiatives have been implemented by the Indonesian Government through environmental projects. Multidisciplinary participatory research and monitoring among stakeholder groups in Indonesia and between regional partners are value-adding opportunities to overcome transactional costs.

Availability of Full Reports

This document is to be read as a supplement to the CD version of the complete State of the Coral Triangle Report of Indonesia.

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