

## Executive Summary

### Introduction

Papua New Guinea (PNG) has a population of over 6 million, with 61% living within 100 km of the coast. Many island and coastal communities rely on marine and coastal ecosystems for their livelihood. However, issues such as poor access to services, low-cash income, and limited options for alternative economic opportunities also exist. The contribution of fisheries to gross domestic product is the smallest compared to other Pacific Island countries, but there is significant potential to increase its economic value through better and more sustainable management.



**Joel Araea, a Community Monitoring Officer in charge of data gathering and enforcement in a Marine Protected Area (MPA) measures a sea cucumber within their MPA with a friend. Sea cucumbers are a vital resource that fetch high prices, especially from the Chinese market where they are considered delicacies. A fishery ban allowed stocks to recover.** Credit: James Morgan

Most of the coral reefs in PNG are in relatively in good condition, but some are under pressure from sedimentation arising from poor land use, i.e. mining, land clearing, oil palm plantation and logging; overfishing, including those of top predators (e.g., sharks and invertebrates, such as sea cucumbers [*bêche-de-mer*]); live reef fish trade; outbreaks of crown-of-thorns sea stars; and coral bleaching. New forms of coastal development, such as deep sea mining, are also emerging. The potential expansion of marine tailings disposal may also arise as a substantial source of pollution. The impacts of climate change are also expected to further degrade coastal habitats, and consequently, associated resources and ecosystem services.

### Biophysical Characteristics

Papua New Guinea is the largest Pacific Island country in terms of total land area at 460,000 km<sup>2</sup>. Its exclusive economic zone (EEZ) is similarly large at 3.12 million km<sup>2</sup> with a coastline that has been measured by Soweil et al (2002) to be 17,110 km and Earth Trends (2003) at 20,197 km. The country is surrounded by three seas and a major gulf (the Bismarck Sea to the north, the Solomon Sea to the north and east, the Coral Sea to the south and east, and the Gulf of Papua to the south, between PNG and Australia).

Its large sea area, considered one of the last frontiers of the Coral Triangle, supports very high marine mega diversity. This includes over 600 species of coral reefs, 1,000 reef building species, 35 mangrove species, 198 species of marine and fresh water decapods crustaceans, 3,000 species of fish, 32 species of large and small whales, 12 species of fresh water turtles, eight species of tuna, six species of marine turtles, one species of freshwater dolphin, and one species of dugong.

Information on coral reefs is limited. Research and monitoring capacity is relatively low, but programs undertaken by nongovernment organizations (NGOs) provide some information. For instance, Rapid Assessment Program surveys carried out by Conservation International in 1998 recorded the presence of over 429 species of coral fauna, including 10 new species. This is believed to be the highest coral diversity recorded so far in Papua New Guinea. This is more than what is found on the entire Great Barrier Reef, and is equal in diversity to the coral faunas of the Philippines and Indonesia.

# Key Statistics

## BIOPHYSICAL

Total land area	460,000 km <sup>2</sup>
Total territorial water area including Exclusive Economic Zone	3,120,000 km <sup>2</sup>
Total coastline length	17,110 km (Sowei et al 2002)
	20,197 km (Earth Trends 2003)
Total coral reef area	40,000 km <sup>2</sup>
Total mangrove area under protection	4,586 km <sup>2</sup>
Number of coral species	600
Number of mangrove species	35
Number of fish species	3,000
Number of species of large and small whales	32
Number of species of tuna	8

## SOCIO-ECONOMIC

Population (2009)	6 million
Annual growth rate (2001)	2.43%



Children fishing in an estuary in PNG. Credit: Erin Michelle Smith / [www.pngperspective.com](http://www.pngperspective.com)



Selected students from the secondary schools in the area answer questions during a Marine Environmental Education Programme conducted by a local NGO - *Mahonia Na Dari* (Guardians of the Sea) Research and Conservation Centre. It is located at the heart of Kimbe Bay, West New Britain. Credit: Stella Chiu-Freund / WWF

**Mangroves** are widespread around the coastal regions of PNG, with particularly extensive stands in and around the deltas of many of major rivers, especially those along the southern coast.

**Seagrass** beds are a common community in the reef flats and coastal lagoons of Papua New Guinea. Many different species occur, including turtlegrass (*Thalassia hemprichii*), *Enbalus acoroides* and species of the genus *Halophila*. These seagrass beds are also a habitat for the dugong, which is listed by the IUCN as a vulnerable species. Formerly widespread in the tropical waters of Southeast Asia, it is now close to extinction, probably due primarily to habitat loss, although indiscriminate hunting in the first half of the last century resulted in massive depletion of its numbers. The Papua New Guinea population of dugong, which is mainly centred in the Papuan Lagoon in the southwest of the country, is of global significance and conservation value as it is likely to be the world's largest population still remaining today.

## Governance

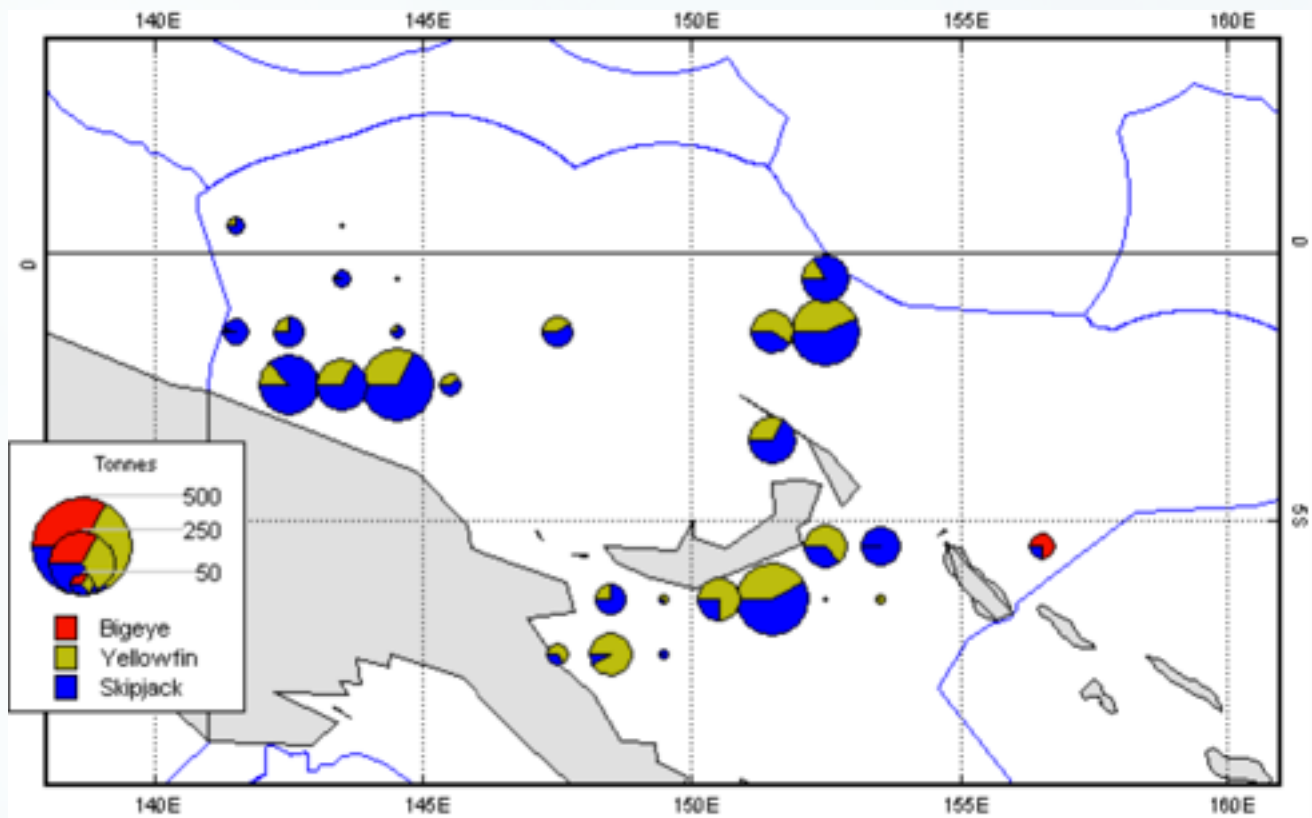
Environmental sustainability is enshrined in the national constitution. As such, there is constitutional basis for the legislative framework to manage the nation's natural resources. The *Environment Act 2000* (as amended in 2002), which became fully operational in 2004, is the primary piece of legislation on the management of natural resources. It is comprehensive but focuses on large scale projects and has no provision for managing the effects of small scale activities prevalent in PNG.

Environmental monitoring, regulation, and management are functions of the national government, but the implementation of the majority of these functions are carried out at the provincial, district, local levels, and at the community and/or village level. However, very few environment-related functions have been decentralized and limitations in capacity and budget are more apparent at the local level. As a result, the application of the requirements of the Environment Act are haphazardly carried out or at worst, provisions are not executed.

The Department of Environment and Conservation (DEC) is the principal national government agency that is responsible for the management of the country's environment and environmental legislation. The DEC is severely constrained in its operations due to extremely limited funding and staff capacity in some areas. Increased budget appropriations will be required to effectively support the mandate of the DEC (impact assessments, compliance monitoring, etc.) and to improve its facilities and capabilities in data, geographic management systems, and similar technologies.

For many of the coastal communities in PNG, **traditional knowledge** dictates and/or guides the (i) ownership of certain sections/zones of the sea; (ii) authority that permits or forbids harvesting; (iii) timeframe and/or duration of closure and open seasons; (iv) methods of harvesting marine animals (fishing gear use); and (v) individuals that harvest (certain clan members, females, newly initiated men, etc.)





**Figure 1. Catch distribution of primary species caught by flagged vessels in 2010 (Source: SPC).**

However, some of the traditional knowledge is eroding due to loss of traditional authority and/or traditional values, increase in population, and the introduction of a cash economy.

The customary rights to manage areas locally are vested in the communal clan or families. Thus, the relevant governance structure must reflect this arrangement. Legal and policy gaps exist in government policies and legislations on coastal community issues. This implies that the promotion of traditional knowledge could be developed further within existing precedents, such as the *Bialla Local Level Government law* on conservation of marine environments.

There are also only a few **marine protected areas (MPAs)** in the country. Awareness and support for marine resource management is mostly limited to areas where NGOs have active programs, such as in Kavieng, Kimbe Bay, Madang, and Manus.

PNG is a signatory to a number of **international and regional environmental conventions**. Although treaties and conventions are officially ratified, there is delay in the associated national legislation and lack of knowledge on how to implement these conventions locally.

### **Social and Economic Importance of Marine Resources and Ecosystems**

**Capture fisheries (commercial and sustenance).** Tuna and prawns are the main commercial fisheries in PNG. The national tuna fishery is composed of purse-seine and longline sectors with a small, but important handline sector. The total catch within PNG waters was 702,969 tons in 2010, a 55% increase from the 2009 catch of 453,129 mt due to the increase in total fishing effort relative to the increase in the

number of fishing vessels, mainly purse seiners. The catch contribution of foreign vessels under access arrangements was 78.7%, PNG chartered vessels (locally based foreign) comprised 16.7%, PNG flag vessels provided 4.1%, and the remaining ~0.5% (3120 mt) from the longline sector. Almost all of the catch from PNG flag vessels was caught inside PNG waters due to the closure of the neighbouring high sea pockets. The catch by PNG chartered vessels outside of PNG waters was 63,397 tons and was taken mainly in the waters of other member countries of the Parties of the Nauru Agreement (Federated States of Micronesia, Kiribati, the Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands, and Tuvalu). The breakdown of catch distribution of primary species by flagged vessels in 2010 is shown in Figure 1.

Information on the amount of by-catch is not available and the lack of such important information could lead to overexploitation of vulnerable species. Given that PNG cannot afford rigorous monitoring and inspection of foreign vessels fishing within the EEZ, this important information is unlikely to become available in the near future unless more innovative means of collecting the information can be found.

**Subsistence and artisanal fisheries.** Although the commercial sector is the major fishery in terms of catch weight, subsistence and artisanal fisheries are arguably more important in socio-economic terms. Fish is the major source of protein and source of cash income for the coastal populations throughout the PNG mainland and islands, and is a part of the staple diet in these areas. The rapid growth in coastal populations and the increasing demand for cash income has in recent years led to an increase in subsistence and artisanal fishing activity, raising serious concerns over the sustainability



**Sindaun Wantaim Senis - Ahus Island (Living With Changes - Ahus Island) is a participatory video scripted, shot and edited by the community of Ahus Island, Manus, Papua New Guinea. Told in their own words, it's the story of how life is changing for this marine community in the face of climate change and global development. Credit: TNC**

of coastal fish stocks, especially species that have high export value, such as *bêche-de-mer* and some of the shellfish, such as *trochus* and the giant clam. There is considerable concern at both local and national levels over recently introduced destructive fishing methods, such as poisoning with derris powder and dynamite fishing.

**Coastal tourism.** In 2005, PNG received close to 70,000 overseas visitors, 74% being business travellers and the remaining 26% holiday travellers. The number of visitors represented an increase of over 17% from the previous year, generating an estimated revenue of 488.5 million Kina.

The tourism industry in PNG as a whole remains largely fragmented despite the support and strategic direction provided by industry bodies, representative associations, and the government through the Tourism Promotion Authority. The only tourism sector that is developed at this time is the diving sector, which accommodates approximately 68% of the tourists in PNG. There is great, unrealized potential for predominantly nature and cultural based tourism in PNG. The Commission is seeking views on the cohesiveness of the current approach towards fostering a sustainable tourism industry.

### Threats And Vulnerabilities

The significant loss of coastal fisheries is very evident along the coastline of PNG. Many of the maritime provinces have agroforestry projects that are located inland and have contributed immensely to the degradation of the marine resources and their habitats over the last 20 years. Discharge from fish processing and the canning industry pose another environmental threat. Food security has also been a very serious problem mainly in the coastal provinces that have major gold and copper mines within their provinces. Cross border issues, for instance with Australia and Indonesia, have also been a large concern. Regulating illegal activities has been particularly challenging owing to the vastness of the country's borders.

The most vulnerable marine species include the freshwater dolphin, the dugong, three species of marine turtle, three species of freshwater turtle, and all of the tuna species. Major threats are the effects of weather patterns, run-off from heavy rain fall, habitat degradation, and loss of foraging and breeding areas through impacts associated with illegal fishing practices and illegal, unreported, and unregulated fishing. Further, there is a lack of research and monitoring of such animals.

### Papua New Guinea and its National Plan of Action

**Goal 1: Improved Governance and Effective Management.** The Bismarck Solomon Seas Ecoregion, including the Admiralty and Bismarck archipelagos and the northern coasts of PNG mainland, covers perhaps some of the last tropical marine ecosystems that remain relatively unaffected by human activities. Large scale marine areas as priority seascapes across the PNG territorial and archipelagic waters are designated to serve as geographical focus for major investments and development in PNG. The Seascape Investment Plans for priority seascapes have been completed, along with arrangements for sequencing investments in line with the PNG Vision 2050.

**Goal 2: EAFM Applied.** To date, PNG does not have specific policies and legislations to address and implement EAFM. However there are draft policies on fish aggregation devices, community based management, and protected areas that compliment and support EAFM. There are no specific legal framework and/or law that address the implementation of EAFM. However, there is adequate legal coverage to implement EAFM using the various legislations at the national and local levels.

**Goal 3: Improved Management of MPAs.** There are no large-scale MPAs in PNG, but there is a large wildlife management area in the Western Province called Maza Wildlife Management Area. It focuses on the protection of turtles and dugongs. The Kimbe Bay Marine Management Area is a network composed of 11 locally managed marine areas.

**Goal 4: Adaptation to Climate Change.** The Government addresses climate change issues using a hazard-based approach. Climate initiatives include addressing coastal flooding, setting up early warning systems, protecting coral reefs, vulnerability assessments, mangrove planting, and provincial consultations. Vulnerability assessments have been undertaken by the PNG's Office of Climate Change and Development in the central province and by NGOs in their respective project sites.

**Goal 5. Threatened Species Status Monitored.** To be supplied.

### 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.

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