

# DEMOGRAPHIC TRENDS IN PHILIPPINES MARINE BIODIVERSITY CONSERVATION PRIORITY AREAS

## Introduction

In 2004 the Philippines Department of Environment and Natural Resources assessed the socio-demographic pressures on the country's terrestrial biogeographical areas and assigned a vulnerability ranking for each conservation area.<sup>1</sup> Such information is essential to assure that investments in integrated population-environment program development are targeted to areas most in need of conservation and human reproductive health inputs. Unfortunately, a similar analysis has yet to be undertaken for the country's 36 marine biodiversity hotspot areas.

In an effort to contribute to the body of knowledge about population dynamics ongoing in Philippines marine hotspots, PATH Foundation Philippines conducted a desk review focusing on two globally-significant marine ecoregions in southern Philippines namely the Sulu Archipelago in the Sulu-Sulawesi Sea, and the Danajon Reef in the Visayas Sea. We chose these hotspots because of their high ecological and economic significance and relatively large population sizes. Information was drawn from a number of official government websites as well as the published literature and unpublished project reports from health, conservation and development agencies. We hope this information will be useful to policymakers, national and local stakeholders and organizations interested in preserving the unique biological diversity of these ecoregions and enhancing the wellbeing of the millions of people living in their fragile ecosystems.

## Sulu-Sulawesi Sea

The Sulu-Sulawesi Sea, with neighboring Indonesian Seas and South China Sea, lies at the center of the world's tropical marine biodiversity. Encircled by 3 populous, developing nations, the Philippines, Indonesia and Malaysia, the Sea and its adjacent coastal and terrestrial ecosystems, supports an estimated 33 million people, of which about 75% are in the Philippines (25 million), 21% in Indonesia (7 million in East Kalimantan and N Sulawesi) and 4% are in Malaysian Sabah (< 2 million). Most are reliant on renewable natural resources for subsistence and livelihood. These resources are being severely impacted by rapid population growth and widespread poverty, coupled with increasing international market demand and rapid technological changes, compounded by inefficiencies in governance and lack of awareness and compliance with some laws by local peoples, particularly in parts of the Philippines and Indonesia. These key root causes all contribute to illegal practices and corruption resulting in severe resource depletion and degradation of water catchments, river, estuarine, coastal, and marine ecosystems (DeVantier *et al.* 2004<sup>2</sup>).

## The Sulu Archipelago

The Sulu Archipelago is a double island chain comprised of over 400 volcanic and coral islands located between the Sulu (northwest) and Celebes (southeast) seas (see Map). The archipelago extends 170 miles (270 km) southwest from Basilan Island off southwestern Mindanao and ends near the eastern shores of Sabah (East Malaysia). The most important islands include Tawitawi, Jolo, Sanga Sanga, Sibutu, Siasi, and Cayayan Sulu.



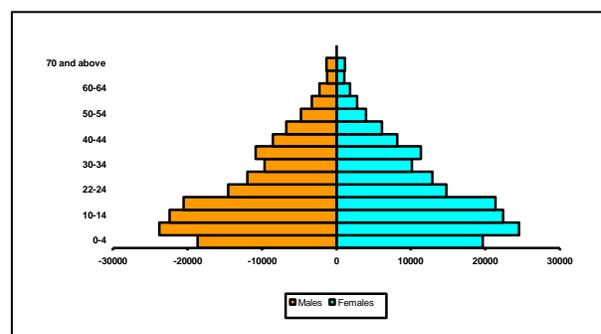
Map of Sulu Archipelago adapted from DeVantier et al. (2004)<sup>2</sup>

## Tawitawi Province

Twenty-five (25) percent of all the coral reef structures remaining in the Philippines lie within the jurisdiction of the island-province of Tawitawi.<sup>3</sup> However, the area has experienced high environmental stress from population pressures and illegal fishing practices that have degraded its coastal ecosystems and threaten food security from the sea. Compounding the situation is the province's high incidence of poverty which increased by 21 percentage points during 1997-2000 – more than any other province in the country.

At the last census (2000) Tawitawi's population totaled 322,317 and was expanding at an annual rate of 5.5% which far exceeds the national average rate (2.4%). At the current rate of growth, it is expected that Tawitawi's population will double in 13.1 years with concomitant increase in anthropogenic stress on the natural resource base. Factors contributing to the population explosion in Tawitawi include in-migration from other provinces and neighboring countries (Malaysia and Indonesia), high total fertility (3.5 children per woman), and low contraceptive practice (7.6 percent) among the predominately Muslim female population. Even if fertility were to plummet today to 2.0 children per woman, the number of people in Tawi-Tawi would still soar because half of its population is under the age of 17 years (2000<sup>4</sup>) which reflects a very high rate of population momentum. Figure 1 below presents the age-sex distribution of Tawitawi's population. The high momentum of Tawi-Tawi's population is expected to fuel 65 percent of its foreseeable growth, while unwanted fertility and desired fertility will contribute another 16 and 19 percent respectively.

Figure 1: Age-Sex Distribution of Tawitawi Province, Philippines (2000). The “bulge” in the young age groups renders high momentum to Tawitawi's population which is expected to double within 13.1 years.



## Demographic Dynamics in Tawitawi's Marine Hotspots

The provincial average rate of population growth in Tawitawi (5.5% per annum) conceals marked disparities among its various municipalities and marine hotspot areas. For example, in the municipality of Sitangkai, which border the Tumindao Reef Complex, the local population is expanding by 7.9% with a doubling time of only 9.1 years. Another demographic trend that is contributing to the loss of marine biodiversity is the high rate of population density in Tawitawi, which averages 296 people per km<sup>2</sup> but ranges as high as 526 in the municipality of Sapa-Sapa and exceeds 1,160 in the Turtle Island Heritage Protected Area, which is home to the world's largest population of nesting green sea turtles.

The high rate of growth, density and momentum of Tawitawi's population has serious implications for the future of the marine environment and the sustainability of coastal and aquatic resources upon which the majority of the population depend for food and livelihood. Other threats to the rich coastal resources of Tawitawi is the almost total lack of management through law enforcement, education and coastal resource management programs to guide the fisheries in their manner of exploitation. The entire area is notorious for rampant illegal fishing through dynamite and other illegal use of nets and collection of mollusks, crustaceans, stony corals, precious corals, sea fans, sea turtles and other rare and often legally protected species. The nearshore fringing reefs are heavily fished and are not considered in good condition in terms of fish density. A survey of fish diversity and abundance in Papahag island only observed 1738 individuals of fish in 1250 square meter area with 58 species of reef fish (BFAR 2000<sup>5</sup>). This is much lower than observed in the reefs in the Central Visayas and thus indicates an overfished reef. Nevertheless, the coral cover on the same reef is quite good with an average 59 percent living coral cover.

Ong and others (2002) have classified the priorities for marine biodiversity conservation in Tawitawi (see Table below). Conservation efforts, however, need to take into consideration the social and demographic factors that are driving over-extraction and habitat degradation of which poverty and population density pose, perhaps, the greatest challenge. Experience from other coastal areas in Philippines suggests that integrated population-health-environment approaches are not only more efficient but generate higher impact on both human and ecosystem health outcomes compared to sectoral approaches<sup>6</sup>. As such, there is a need to strengthen coordination and collaboration among conservation, health and family planning organizations and among public and private sector organizations operating in Tawitawi to better address the inter-related population-health-environment (PHE) dynamics at play in marine hotspot areas. Towards this end, PATH Foundation Philippines Inc. and WWF-Philippines collaborated with UNFPA-Philippines on an integrated PHE project in Tawitawi that strengthened the capacity of local institutions to simultaneously implement community based family planning and coastal resource management strategies on the densely crowded island of Sitangkai. The project supported community efforts to establish and manage a fish sanctuary in the Tumindao Reef Complex and empowered women and youth in the barangays with reproductive health information and services and expanded access to modern methods of contraception. The potential exists to replicate the same approach in other Tawitawi hotspots but funding remains a problem as most donor organizations still prefer to support sectoral programs.

| Marine Biodiversity Conservation Priorities for Tawitawi Province<br>(Ong <i>et al.</i> 2002 <sup>7</sup> ) |  |                |
|---|--|----------------|
| AREA  | BIODIVERSITY PRIORITIES  | CLASSIFICATION |
| Tawi-Tawi (main islands including Sitangkai)  | Overall marine priority <ul style="list-style-type: none"> <li>• Reef fishes, Corals</li> <li>• Molluscs, Molluscs,</li> <li>• Sea grasses, Seaweeds</li> <li>• Elasmobranchs</li> </ul> | Very High      |
| Tawi-Tawi (Turtle Islands)  | Overall marine priority <ul style="list-style-type: none"> <li>• Reef fishes, Corals</li> <li>• Sea grasses, Cetaceans</li> <li>• Elasmobranchs, Turtles</li> </ul>                      | Extremely High |

<sup>1</sup> Department of Environment and Natural Resources-Protected Areas and Wildlife Bureau (DENR-PAWB) and Conservation International-Philippines. 2004 *Mapping Population-Biodiversity Connections in Philippines*. Final Report. ISBN 971-926-40-1-2.

<sup>2</sup> Excerpts from: DeVantier, L., Alcala, A. & Wilkinson C. (2004). The Sulu-Sulawesi Sea: Environmental and Socioeconomic Status, Future Prognosis and Ameliorative Policy Options. *Ambio* Vol. 33 No. 1–2.

<sup>3</sup> DeLaPaz, MC. & Colson, L. (2008) Population, Health and Environment Issues in the Philippines. A Profile of the Autonomous Region in Muslim Mindanao (ARMM). Population Reference Bureau. Washington, D.C. USA

<sup>4</sup> <http://www.census.gov.ph/data/pressrelease/2002/pr02138tx.html>

<sup>5</sup> Bureau of Fisheries and Aquatic Resources (BFAR). 2000. Coastal Resources Management Assessment of Papahag Island, Bongao, Tawi-Tawi (Prepared by N. Katada and A.S. Pendulat). BFAR Regional Office Autonomous Region in Muslim Mindanao, 37 p.

<sup>6</sup> Castro, J. and D'Agnes, L. (2008) Fishing for Families: Reproductive Health and Integrated Coastal Management in Philippines. FOCUS Issue 15. ECSP. Woodrow Wilson International Center for Scholars. Washington, D.C.

<sup>7</sup> Ong, P.S., L.E. Afuang, and R.G. Rosell-Ambal (eds.). 2002. *Philippine Biodiversity Conservation Priorities: A Second Iteration of the National Biodiversity Strategy and Action Plan*. Department of Environment and Natural Resources-Protected Areas and Wildlife Bureau, Conservation International Philippines, Biodiversity Conservation Program-University of the Philippine Center for Integrative and Development Studies, and Foundation for the Philippine Environment, Quezon City, Philippines, 113 p.