CORAL TRIANGLE INITIATIVE
ON CORAL REEFS, FISHERIES AND FOOD SECURITY
PHILIPPINES

TAYTAY:
Taking Charge of a Critical Resource

A Case Study on the Philippines

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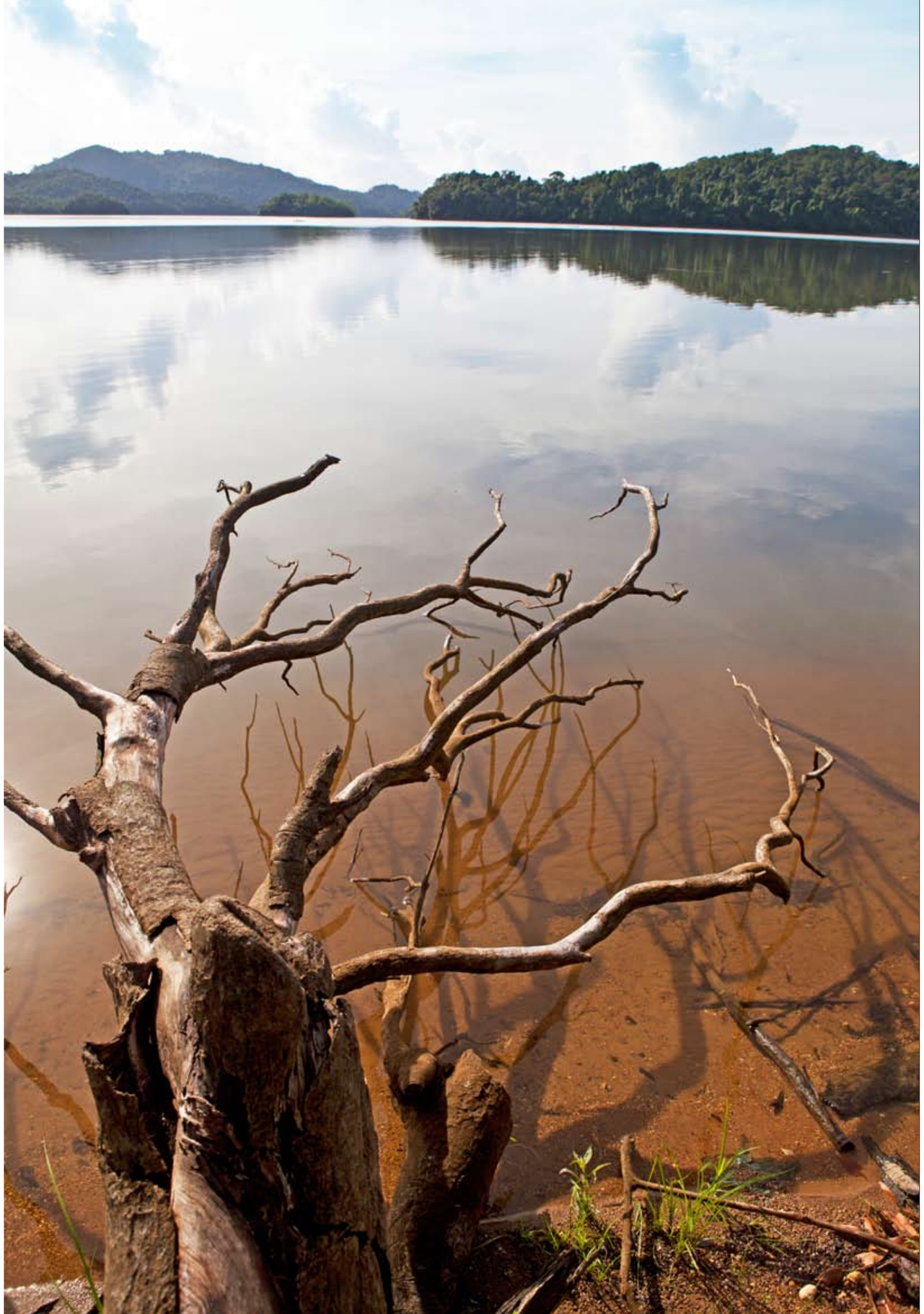

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TAYTAY

Taking Charge of a Critical Resource

A Case Study on the Philippines

This case study on Taytay is the sixth in a series of analyses being undertaken by WWF-Philippines. This series aims to communicate key issues and lessons from field projects to fellow practitioners, program and policy staff, personnel of managed and/or protected areas, partners, and donors.

The first in the series was on the Turtle Islands in Tawi-Tawi, which tackled the issues of entry points for conservation, and how resource management ultimately depended on governance. The second case study discussed the establishment and operating systems of the multi-stakeholder environmental law enforcement program of El Nido, Palawan. The third study described how Tubbataha, a pair of offshore reefs 130 kilometers from the nearest island, works as a protected area. The fourth case related the establishment of conservation fees paid by scuba-divers in Mabini and Tingloy, Batangas. The fifth case study told the story of Donsol, Sorsogon and how the constant presence of whale sharks has transformed a small town into one of the world's best wildlife interaction tourist sites, even as it continues to struggle with problems in fisheries management.

This case study on Taytay, Palawan is about the transformation of a municipal government from resource users, into a passive participant in a national protected area program, and ultimately into a champion and model of resource management.

The goal of these case studies is to help create a stronger understanding of the issues, and to promote further learning and sharing of successes and challenges. We welcome feedback on this case study, and on any others in this series. Please e-mail Joel Palma, Vice President for Conservation Programmes, WWF-Philippines (jpalma@wwf.org.ph).

Malampaya Sound on the west coast of Taytay is dubbed the "fish bowl" of the Philippines because of its rich fishing grounds.

I. A Fishing Haven

Taytay is a municipality that lies north of mainland Palawan. It is bordered on the north by El Nido, an area famous for its dramatic limestone island formations. Taytay may be eclipsed by its neighbor in terms of tourism, but it outshines El Nido in fisheries. Palawan has always been at the top of the country's list in terms of marine municipal fisheries production, yielding 150,000 metric tons in 2012. It is followed by Iloilo, which produces just about a third of that volume, at 58,000 metric tons. Taytay further ranks among top producer municipalities in the province with its catches of anchovies, coral trout, red-belly yellow-tailed caesio, and tuna.

Taytay is one of the larger municipalities of the country in terms of land area. At 126,768 hectares, it is comparable in size to the province of Bataan. Its municipal waters cover even more area, and because of the elongated shape of the Palawan mainland, Taytay has very distinct east and west coasts. To the east is Taytay Bay at 196,000 hectares, which opens to the Sulu Sea. To the west is Malampaya Sound at 107,000 hectares, which empties into the West Philippine Sea. Both coastlines are very long and rugged; Taytay Bay, with its islands, has an estimated coastline of 460 kilometers, while Malampaya is 60 kilometers long from its headwaters to the mouth of the sound.

Malampaya is famous for its abundant fisheries and its Irrawaddy dolphins (*Orcaella brevirostris*), a critically endangered species found only in a few remote places in Southeast Asia. Taytay Bay, on the other hand, is a known habitat of dugongs (*Dugong dugon*), and a source of the Live Reef Fish Trade (LRFT), particularly for coral trout *(Plectropomus leopardus*), locally called *suno.*

Not all of Taytay's biodiversity riches are found underwater. It boasts of Palawan's endemic birds such as the cockatoo, mynah, hornbill, white-bellied sea eagle, osprey, and tabon. Its mammalian wildlife includes the anteater, bearcat, and wild boar.

Centuries of resource use

As a town, Taytay has a long history, having been established even before the Spanish occupation of the Philippines. It served as the capital of the province as the latter evolved through various names — from Calamianes (1521), to Castilla (1859), and then to Paragua (1862) — until the capital was transferred to Cuyo in 1873. To this day, Fort Santa Isabel testifies to Taytay's importance during the Spanish era, standing guard over the town's pier.

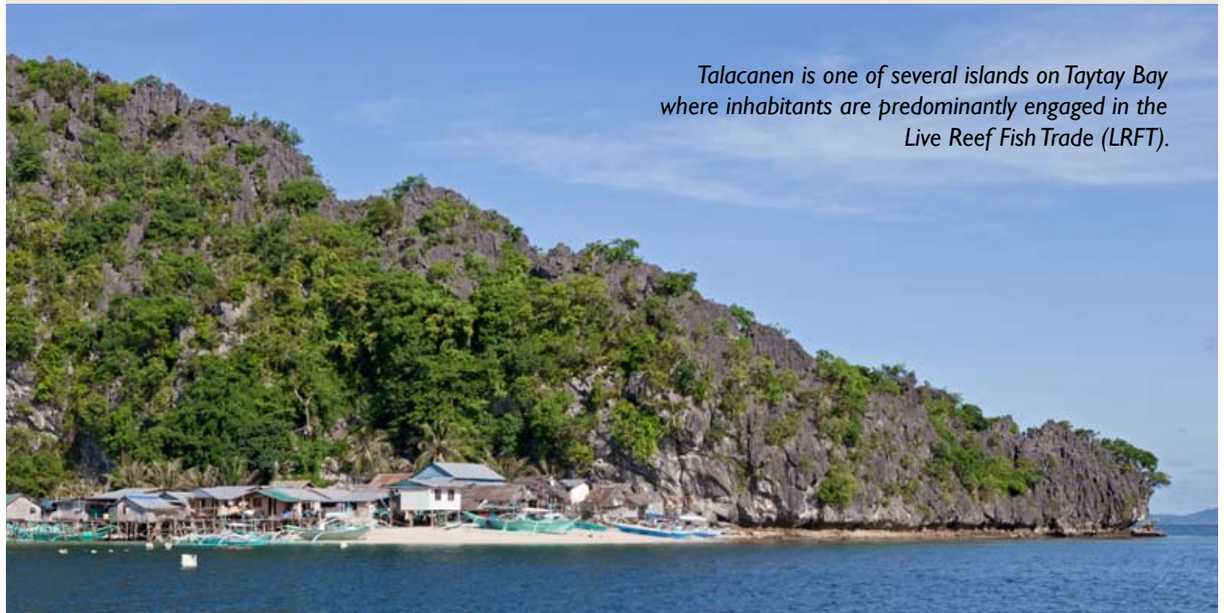
The indigenous population of central and northern Palawan are the Tagbanua, and their relationship with, and use of, natural resources has spanned over a thousand years. Artefacts found in the province reveal a history of trading with the Chinese, as well as influences of the Samal people and the sultanate of Sulu. Although Taytay served as one of the Spanish strongholds guarding against Muslim raids, it was only the onset of logging operations during the American period in the 1920s that brought an influx of migrants.

By the middle of the century, Malampaya Sound, the western coast of the island, had been established as the "fish bowl" of the country. Anecdotal accounts of fishers told of "shrimp boils," when there were so much shrimp or fish that the surface of the sea looked like it was boiling. By the year 2000, the Tagbanua, the original inhabitants of Taytay, had been reduced to only one percent of the population, the rest being migrants, mostly from the Visayas.

The national census of 2010 pegged the population of Taytay at 70,837. Seventy percent is estimated to be dependent on fishing. To say that fishing pressure is tremendous would be an understatement. Such pressure comes not only from the local population, but also from neighboring municipalities and provinces, purportedly from as far away as Mindoro and the Visayas, as well as the commercial fishing vessels that have plied the area's waters for over half a century.

The continuing productivity of Taytay's waters belies its dark fishing history. Like most areas in the country, it has suffered from destructive fishing practices, such as the use of dynamite and cyanide, and *muro ami*, a fishing method where reefs are encircled by nets, and divers bang rocks on the corals to drive fish away from their hiding places into the waiting nets.

Other threats to the environment are also present. Past logging operations have compromised the integrity of Palawan's forests, and rising populations meant forest land had to give way to agriculture and other uses. Combined, they contribute to land-based pollution and siltation. Deforestation has also affected Taytay's mangroves, which have been converted to other land uses or harvested for use as firewood.



Talacanen is one of several islands on Taytay Bay where inhabitants are predominantly engaged in the Live Reef Fish Trade (LRFT).

Malampaya Sound

National protected areas

Taytay has two National Integrated Protected Areas System (NIPAS) sites: the El Nido-Taytay Managed Resource Protected Area (ENTMRPA), declared in 1998, and the Malampaya Sound Protected Land and Seascape (MSPLS), established in 2000.

The ENTMRPA includes only a small part of Taytay, with three *barangays* (villages) belonging to the Mt. Kapwas watershed, which extends from El Nido to Taytay. On the other hand, MSPLS practically covers the western half of the municipality, 18 of Taytay's 31 barangays. Both belong to the Environmentally Critical Areas Network (ECAN) of Palawan.

The establishment of both protected areas was supported by the European Union (EU) through the National Integrated Protected Areas Programme (NIPAP), a project co-managed by the Department of Environment and Natural Resources (DENR). From 1996 to 2001, the project provided logistical, administrative, and legal support to establish the protected areas. Protected area offices were built, Protected Area Management Boards (PAMBs) organized, and general management plans developed. Both protected areas were proclaimed by presidential decrees, signed by then President Joseph Estrada.

At the end of the NIPAP project in 2001, in accordance with project design, management of the protected areas was turned over to the DENR. In the case of MSPLS, its general management plan indicated an annual budget of PhP10 million (US$244,000). The problem was that neither the DENR nor the government of the Philippines, for that matter, had the means to continue the level of funding that the EU provided to establish the protected areas. The ensuing years saw a drastic drop in operations, with the Protected Area Office eventually ending up with an operations budget of PhP12,000 (US$250) per year.

Irrawaddy dolphins

WWF Philippines started working in Taytay in 2000, through its Irrawaddy Research and Conservation Program, funded by Shell Philippines Exploration B.V. (SPEX). At the time, WWF had a marine mammal program, and thus its initial interest in Taytay was due to the Irrawaddy dolphins.

It was only in 1995 that a DENR aerial photography survey caught the dolphins on film for the first time in Malampaya, and since they were taken from a distance, the dolphin was initially suspected to be a finless porpoise. Through the survey of the Inter-agency Task Force on Marine Mammals, Dr. Louella Dolar of Silliman University confirmed the presence of the Irrawaddy in Malamapaya.

The goal of WWF's Irrawaddy project was to develop a program that would reduce the mortality of the dolphins over the next 10 years. In order to do this, baseline information had to be gathered, not only on the dolphins but on the factors that affect the health of the Malampaya Sound. Biological, geological, and socioeconomic researches were conducted. Through the abundance survey conducted in 2001, the population of the Irrawaddy in Malampaya was established at 77 individuals. The project developed a monitoring and reporting system which documented dolphin mortality, ranging from two to seven mortalities per year from 2001 to 2007, with the primary cause of death being the dolphin's ending up as fishery by-catch.

The population of rare Irrawaddy dolphins in Malampaya Sound was established at 77 individuals in 2001, with two to seven mortalities recorded annually since then. © WWF/Mavic Matillano

Stepping up to the plate

During the establishment of its two national protected areas, as a matter of policy, the municipal government of Taytay became a member of the Protected Area Management Boards (PAMBs) of ENTMRPA and MSPLS. However, although the municipality was always represented in meetings, its participation was not very active. In the case of El Nido's PAMB, this was understandable, since only three barangays of Taytay overlapped with the protected area. In the case of Malampaya's PAMB, since the seat of the municipality is on the east coast and the protected area is on the west, the officials of the affected barangays generally played a more active role than the municipal government.

However, the municipal government's passive attitude toward conservation programs in the municipality began to change after EU's support ended in 2001, and the reduced patrols in the protected area saw a resurgence in illegal fishing and logging. The results of the various researches conducted by WWF for its Irrawaddy project also contributed to the growing awareness of the need to conserve Taytay's natural resources, initiated by the protected area. As part of the information drive on the dolphins, WWF created a mascot named Waddy, whose popularity in community and school events proved effective in inspiring a sense of ownership and pride, especially among school children.

In response to the problem at hand, the municipality created a technical working group to reconcile conflicting and/or overlapping policies, and to develop strategies that would deliver long-term and cost-efficient results. Its most significant output was the Municipal Fishery Code of Taytay, approved in 2004. Under the code, Taytay's Municipal Fishery Trust Fund was created, which raised revenue from fishery-related registration and licensing permits, auxiliary fees, and administrative fines. Half of the fisheries revenue went to the fishery trust fund, of which 40 percent supported the operations of the MSPLS, and 60 percent was for Taytay Bay. From 2008 to 2012, the municipal fishery trust fund amounted to an annual average

Waddy the mascot. © WWF/Mavic Matillano

of PhP2 million (US$48,000). Since the fund was established, the municipal government has been supporting the operations of the park, while the national government merely provides administrative function through its personnel.

The NIPAS provides for a financing mechanism called the Integrated Protected Areas Fund (IPAF), wherein the collected fees of the protected area would be centralized in Manila, and 25 percent would be returned to the PA. The intent is for high-income protected areas to subsidize those with low or no income at all. However, none of the NIPAS sites have proven to be profitable, and MSPLS does not have a collection system. The convoluted system of centralizing the funds prior to distribution became the IPAF's own bane. Ironically, protected areas were kept under the national government's jurisdiction, already assuming that local governments would be unable to manage them effectively. In the case of MSPLS, it would have been just another "paper park," had the municipal government not taken it upon itself to fill in the shoes of the national government in financing the protected area.

At present, the Protected Area Office is implementing a project funded by the Global Environment Facility of the United Nations Development Program (UNDP-GEF) to update the general management plan, with a livelihood component. The Malampaya Foundation operates in the Outer Malampaya Sound, offering supplemental livelihood for fishers and establishing MPAs.

Proper handling, packaging and transport are crucial to ensuring the fish reach retailers alive.

II. The Live Reef Fish Trade (LRFT)

In theory, the LRFT is simple — reef fish are caught and kept alive right until the moment they are cooked in a restaurant or hotel. In reality, the trade is besieged by many issues at every level of the process.

At the source, the issues are overfishing; catching of juveniles; using noxious substances (mostly sodium cyanide) to catch the fish easily; and highly targeted fishing for high value species, to the point of disrupting the food chain in source areas. Although some species of groupers are already being bred in aquaculture laboratories and farms, coral trout, the preferred species in Taytay, have not yet been bred for production on a commercial scale. In some cases, targeted species like the humphead wrasse (*Cheilinus undulatus*) have been harvested to the point that it is now classified as an endangered species in the International Union for Conservation of Nature (IUCN) Red List.

Once caught, good-sized fish — meaning 500 grams to one kilogram, or what LRFT players call "plate size" — are sold directly for export. However, in areas like Taytay, juvenile fish are put in fish cages to be grown until they reach the desired size. Rearing the live reef fish in cages means they have to be fed, and fishers catch "trash fish," which is actually fit for human consumption, for feed. Other issues at this stage are carrying capacity and water pollution in areas where the cages are maintained.

LRFT is high value. A study commissioned by the Asian Development Bank (ADB) in 2002 estimated that the trade is worth US$810 million annually. For a fisherman in Taytay, the value of a kilogram of coral trout, the most heavily traded species in the entire industry, is about 50 times what he would get for other common species of fish. Because of the environmental and ecological issues the trade brings with it, export is regulated in some source countries but not in its main market, Hong Kong and mainland China. This situation renders itself open to smuggling, and illegally transported goods become part of Illegal, Unreported, and Unregulated (IUU) fishing.

The demand for the product is huge, and appears limitless as China's economy continues to grow, further increasing the market's purchasing

power. Importers are always on the lookout for new sources, and an importer in Hong Kong told Lory Tan, Vice Chair and CEO of WWF Philippines, that the best-tasting live reef fish are from Palawan, but the most stable source is Australia, a quandary which reveals the problems of the Philippines as a source country.

On the part of the consumer, Chinese custom dictates the need to serve live reef fish during special occasions. It is a status symbol, as there is the superstition that good luck comes when you serve the best fish — in this case, the reddest coral trout money can buy. A survey conducted by WWF Hong Kong indicated that the end buyers do not care much about health, safety, and environmental issues in using sodium cyanide to catch the fish, making a market-driven demand for environmental standards — such as that for dolphin-friendly tuna in Europe and the United States — impossible to create at present.

The history of the LRFT does not bode well. International trade began in the 1970s, with Coron in northern Palawan as the main source. Over the next three decades, sources of LRFT expanded in concentric circles that now reach India, the Pacific islands, and northern Australia. However, outside of Australia, the top source countries are still Malaysia, Indonesia, and the Philippines. Communities that become new sources of live reef fish experience a spike in income, only to find their resources depleted after a few years. This trend is common in LRFT, thus earning it a reputation as a "boom-and-bust" fishery. The proliferation of fish cages in Taytay is already a clear indication that natural regeneration can no longer keep up with the demand.

Bright red, "plate size" and unblemished appearance will fetch a high price.

Contradicting polices on LRFT

The Philippine Fisheries Code (Republic Act 8550) prohibits the export of live reef food fish that did not come from hatcheries, rendering the LRFT in Taytay illegal, since the fish are caught in the wild. However, using the mandate of the Strategic Environmental Plan for Palawan (Republic Act 7611), the Palawan Council for Sustainable Development (PCSD) has promulgated and is implementing laws governing the trade, under the premise that the LRFT is for shipment to Manila and not for export. The provincial and municipal governments have followed suit, using the mandate of the Local Government Code (Republic Act 7160).

PCSD regulations on LRFT. As a special area for biodiversity, Palawan is geographically zoned according to degree of required protection under a system called the Environmentally Critical Areas Network (ECAN). The ECAN includes measures intended to protect species in areas under protective management. To carry out these measures, PCSD regulates the harvesting and trade of LRFT. It has one administrative order and two resolutions. Administrative Order 2000-05 and Resolution 2003-09 require persons or groups involved in LRFT to be accredited by PCSD to engage in its component activities. Resolution 2007-340 sets the quota of LRFT production for the province. This resolution, which contradicts Section 61 of the Philippine Fisheries Code, is currently under review. The PCSD administrative orders and resolution are considered national laws, because the PCSD is a national entity.

Provincial regulations. The provincial government of Palawan supports the national laws through its four ordinances on LRFT. Provincial Ordinance 941 requires the local government units (LGU) to operate sanctuaries, preferably in LRFT spawning aggregation areas, and prescribes an open and closed season for harvesting LRFT. Provincial Ordinance No. 1993-02 bans the gathering, buying, selling, and shipment of live fish in Palawan. These ordinances are generally consistent with the Philippine Fisheries Code. However, two succeeding ordinances (Provincial Ordinances No. 1994-29 and No. 1998-332) lifted the ban on some species, including the Napoleon wrasse, but this was later reinstated under Provincial Ordinances No. 2006-941 and 2006-946.

Municipal regulations. The Philippine Fisheries Code and the Local Government Code give the power over municipal waters to the municipality or city. Taytay regulates LRFT through two ordinances. One requires all fishing operators to obtain a municipal license (Ordinance 06-140). Another is its Municipal Fishery Code (Ordinance 05-04), which is largely hewn to the provisions of the Philippine Fisheries Code, except in its prohibitions pertaining to LRFT. The municipality is now updating its Comprehensive Land and Water Use Plan (CLWUP), which would incorporate its Coastal Resource Management (CRM) plan.

Undersized and juvenile reef fish are kept in fish cages until they reach 500 grams to 1 kilogram, the size desired by the market.

Beginnings of LRFT initiative

The LRFT initiatives of WWF Philippines in Palawan had very humble beginnings. It began in 2007 with a visit to the Philippines by Dr. Yvonne Sadovy, a professor at the University of Hong Kong and Chair of the IUCN Committee on Wrasses and Groupers. Her visit resulted in a US$2,790 grant from the Society for the Conservation of Reef Fish Aggregations (SCRFA), where Dr. Sadovy also serves as Director, for WWF Philippines to search for spawning aggregation sites in Palawan. Over the next couple of years, WWF continued to conduct more research projects on LRFT, with support from the Embassy of the United Kingdom, the Coral Triangle Network Initiative (CTNI) of WWF International, and the National Oceanographic and Atmospheric Administration (NOAA) of the United States government.

Among the findings of the LRFT profiling was that Palawan produced 70 percent of the Philippines' LRFT export, despite being only one of 36 sources in the country. In Palawan, 16 of 23 municipalities were documented sources. The major transhipment points were the municipalities of Roxas, Taytay, and Coron, all in northern Palawan, although there were also shipments coming from Balabac, Magsaysay, and San Vicente. LRFT was banned in Puerto Princesa City and El Nido, so in spite of having the better airports, they were not transhipment points, although fishers still engaged in the trade and sold their catch in other municipalities.

The profile revealed the southward trend of the sourcing of LRFT. Whereas Coron used to be the major source, it was now mainly a transhipment point, with the fish coming from neighboring municipalities. The same was true for Roxas. Taytay, on the other hand, was both a shipment point and a source because of the proliferation of fish cages. The presence of cages for growing LRFT meant that the fish being caught were undersized and juvenile, which meant that the area was already being overfished. Quezon in the south was a major source, but fishers were still able to catch good-sized coral trout, and therefore there were very few cages at the time.

The results of the studies were presented periodically to the Palawan Council for Sustainable Development (PCSD) and the Provincial Council. At the time, PCSD was deliberating its resolution on the quota system for the LRFT. Because the two councils had many members in common and holding discussions on LRFT policies was like opening a Pandora's box, the Provincial Council pondered whether it should resurrect its 1993 total ban on LRFT.

During that time, Evelyn Rodriguez was a member of the Provincial Council as President of the Association of Barangay Captains of Palawan. She was the barangay captain of the Poblacion of Taytay, after having served three consecutive terms as municipal mayor. She was in staunch opposition to a total ban on LRFT, because it was a major source of income for both the fishers and the municipal government of Taytay. When asked for its position by both councils, WWF's official reply was that it was also against banning the LRFT, not only because of the negative impact it would have on those whose livelihoods depended on it, but because no branch of the Philippine government —national, provincial, municipal, or barangay — had the capacity to enforce it. Banning the trade would only drive it underground, negating the possibility of regulation and management. And so, then-ABC President Rodriguez and WWF found themselves sharing the same stand on the LRFT.

As part of the CTNI project, WWF organized an LRFT summit in February 2009, where the results of the provincial profile were presented to more than a hundred stakeholders from all over Palawan. One of the consensuses reached was to attempt better management at source, which is what WWF proposed to be the focus of its component in the Coral Triangle Support Partnership (CTSP) project. Funded by the United States Agency for International Development (USAID) as part of its US Coral Triangle Initiative (USCTI) program, an LRFT management plan became one of WWF's deliverables in the first year of the project, which necessitated more comprehensive information on the fishery. WWF commissioned the Western Philippines University (WPU) and the Environmental Legal Assistance Center (ELAC) to characterize the biological resources and legal framework, respectively, to gather the prerequisite information in order to develop the management plan.

LRFT is a significant source of income for residents and the municipal government of Taytay.

Almost 70% of LRF cages in northern Palawan can be found in Taytay Bay.

Coral trout are put to sleep for packaging and transport.

LRFT in Taytay

The live reef fish trade for food started in Taytay in the early 1980s, with fishers directly selling their catch to shippers, who then transported the fish to Manila. By the year 2000, Taytay had become a major source of live reef fish, and traders established buying stations on the island of Biton. Its profitability made it easy for people to shift their livelihoods to LRFT. Residents say they used to plant rice, corn, cashew, and coconut, but eventually stopped because LRFT was much more profitable.

As demand increased, fishing pressure also increased. As the fishes being caught started getting smaller, fishers started putting them in cages and feeding them until they grew to the size desired by the market. This practice of caging started in the year 2000 in Taytay Bay. The year 2006 saw a sharp increase in the number of fish cages, and by the 2008 survey conducted by WWF, a total of 1,024 cagers and 2,586 cages were documented in Taytay, representing the highest number of industry players, at 64 percent and 69 percent respectively, for northern Palawan. In the same year, PCSD reported a total of 17 accredited traders and cagers in the municipality, also the highest record in the province, with operations running the gamut from fishing to shipping.

The 2008 study also showed that 81 percent of those involved in LRFT in Taytay were sustenance cagers, with cages distributed haphazardly throughout the bay and who did not have any legal papers for their operations. For these sustenance cagers, caging was a source of immediate cash, and not an investment for long-term profit.

Fish catch monitoring data for the month of August 2009 showed that the total yield from Taytay amounted to 337.2 tons. The highest percentage (34 percent) was caught by hook and line, with 2,479 fishers using this method. The catch by compressor came second at 27 percent, with 362 users. However, the catch per unit effort (CPUE) of compressor users was 2.3 kilograms per hour per fisher, second only to purse seine, locally called *basnig*.

The same study showed that groupers constituted five percent of the total fish catch from the bay, and only 13 percent of these were traded as LRFT. Coral trout, the main commodity for LRFT in Taytay, comprised less than one percent of the total fish catch. The small size of the groupers caught was noted. Although the live reef fishers of Taytay were known to reach areas outside municipal waters such as Hart Reef, their major fishing ground remained Taytay Bay.

A concurrent study noted the suitability of Taytay Bay for mariculture, of which pearl farming had the lion's share at 18,000 hectares. Seaweed farms were estimated to cover 1,000 hectares, while live reef fish cages occupied an aggregate area of five hectares. Around 28 percent of the mariculture area in the bay integrated LRFT operation with seaweed farming. However, there were indicators that the sustainability of mariculture in Taytay Bay was deteriorating. Mangrove areas were already partly degraded, while portions of the coral reef area were classified as poor. There was reported illegal fishing. Although no river discharged into the bay, the continuing logging of the remaining forest and expansion of farmland had increased the siltation rate.

According to the income profile, LRFT was not only supporting numerous households; it was keeping them out of poverty. An average household in Taytay engaged in LRFT earned PhP382,940 (US$9,300) per year. This was almost five times the poverty threshold for the province of Palawan at PhP83,100 (US$2,000) per year. Almost 54 percent of the LRFT producer's household income was from LRFT. Although on average the household had two to three income sources and used two fishing methods, its dependence on LRFT was still highly significant. The municipal government likewise earned a substantial amount from LRFT through licensing and other fees, which supported the Malampaya protected area and the municipal fisheries management program. Therefore, the sustainability of Taytay Bay in general — and LRFT in particular — was vital to the municipal economy of Taytay.

Seaweed farming is another popular mariculture activity in Taytay Bay.

Good sized fish are sold directly to market, while undersized fish are put in fish cages and fed "trash fish", which is actually fit for human consumption. When the fish reach the desired size, they are sold to aquarium owners where they are "conditioned" and packaged for their flight to Manila, and onward mostly to Hong Kong.

Pioneering LRFT management at the source

The results of the various researches conducted were presented to stakeholders of LRFT in Taytay — composed of the municipal government, LRFT traders, cagers, and fishers — in a fisheries management planning workshop held in September 2009. The workshop output was the LRFT sustainability plan for Taytay for the next 10 years. The priorities identified by the municipality were: the establishment and maintenance of a robust database on LRFT; policy development and enforcement, particularly to prevent ecological destruction and overfishing; identification of spawning aggregation sites in order to declare and manage them as Marine Protected Areas (MPAs); and keeping abreast of technology on full cycle mariculture and promoting best practices on culturing, handling, and marketing. Through the Municipal Fisheries Ordinance revision of 2011, the municipality created a policy that no new fish cages would be allowed after December 31, 2011.

The municipal government of Taytay is declaring spawning aggregation sites as MPAs and implementing fishery management regulations in its attempt to make LRFT sustainable.

Replication in other sites and uptake by provincial government

In the two years following the LRFT management planning in Taytay, the process was replicated in three other municipalities of Palawan: Araceli and Dumaran, neighbors of Taytay to the southeast; and Quezon, farther south of Palawan, facing the West Philippine Sea. Araceli and Dumaran are also sites of CTSP, while the project in Quezon is being supported by the Danish International Development Agency (DANIDA) through WWF Denmark.

Because LRFT is a recurring and important issue for Palawan, both the PCSD and the Provincial Council asked WWF to make a presentation on its projects every now and then. Thus, they are kept abreast of WWF's LRFT program and the emerging information from the various researches being conducted. In December 2012, the Provincial Council issued a resolution enjoining DA-BFAR and WWF to work together with local institutions to develop a road map to make LRFT sustainable. In response, WWF has been working with the Office of the Provincial Agriculturist, initially for the Palawan MPA Network planning workshop conducted in February 2013, and currently for a more comprehensive Coastal Resource Management (CRM) planning scheduled in September 2013, when the newly elected officials have taken office and just before the end of the CTSP project.

Climate Change Adaptation (CCA)

After the LRFT workshop, it was a confluence of nature, economics, and conservation that allowed climate change to take center stage in Taytay's LRFT. In July 2010, Joie Matillano, a Palaweño volunteer pursuing his doctorate degree in aquatic biology, went diving in Taytay Bay, in the reefs of Tecas and Maliao. He took a photograph of strangely-colored corals, in light pink and various pastel shades. WWF asked Dr. Wilfredo Licuanan, Director of Br. Alfred Shields FSC Ocean Research Center and Professor at the Biology Department of the College of Science of the De La Salle University, to look at the photographs, and Licuanan declared that the corals had been caught in the act of bleaching. True enough, a couple of months after the photos were taken, the corals had turned white and were mostly dead. They were overgrown with algae in less than a year. This was the first known incident of coral bleaching in Tecas Reef, an MPA established in 2007 because it was identified as a spawning aggregation site and guarded round the clock by the municipality.

On the part of CTSP, Climate Change Adaptation (CCA) planning was part of project activities scheduled for 2011. For the municipal government and LRFT industry players, the coral bleaching brought to the fore that the effects of climate change — in this case, the increase in sea surface temperature — could pose a real and direct threat to their livelihoods, as their supply of live reef fish is dependent on healthy coral reefs.

The project used a risk-based approach to facilitate CCA planning in Taytay. Based on historical incidents, the hazards identified for Taytay were flooding, storm surges, and landslides due to changing and potentially increasing rainfall patterns. Sea level rise was included as a potential hazard, because majority of human settlements were on the coast. Priority actions identified during the CCA planning workshop included the improvement of site selection for infrastructure; reforestation of mangrove forests as protection against storm surge; and the addition and patrolling of MPAs. Crosscutting priority actions were the enhancement of their Comprehensive Land and Water Use Plan and the establishment of information and feedback mechanisms.

Of the four hazards, the warming of sea surface and its concomitant coral bleaching were deemed the most imminent climate change hazard by LRFT players because of their potentially disastrous impact on their livelihoods. Because of this, project assistance on CCA focused on monitoring of coral reefs for incidences of and recovery from coral bleaching. Five monitoring stations were established by the Marine Environment and Resources Foundation (MERF), Inc. in Taytay Bay. Monitoring surveys were conducted annually from 2011 to 2013.

Of the five reef monitoring stations, those found in the inner portions of the bay — Tecas, Lopez, and Tabuyo — were hardest hit by the bleaching event, while Black Rock and Nabat on the outer part of the bay were barely affected. This pattern was likely caused by the better flushing of seawater in the outer bay area, meaning the warmer water did not stay as long as it did in the inner areas. The warming of the seas coincided with the southwest monsoon, further contributing to the weak flushing of the bay, which faces east.

Coral in the process of bleaching.
© WWF/ Joie Matillano

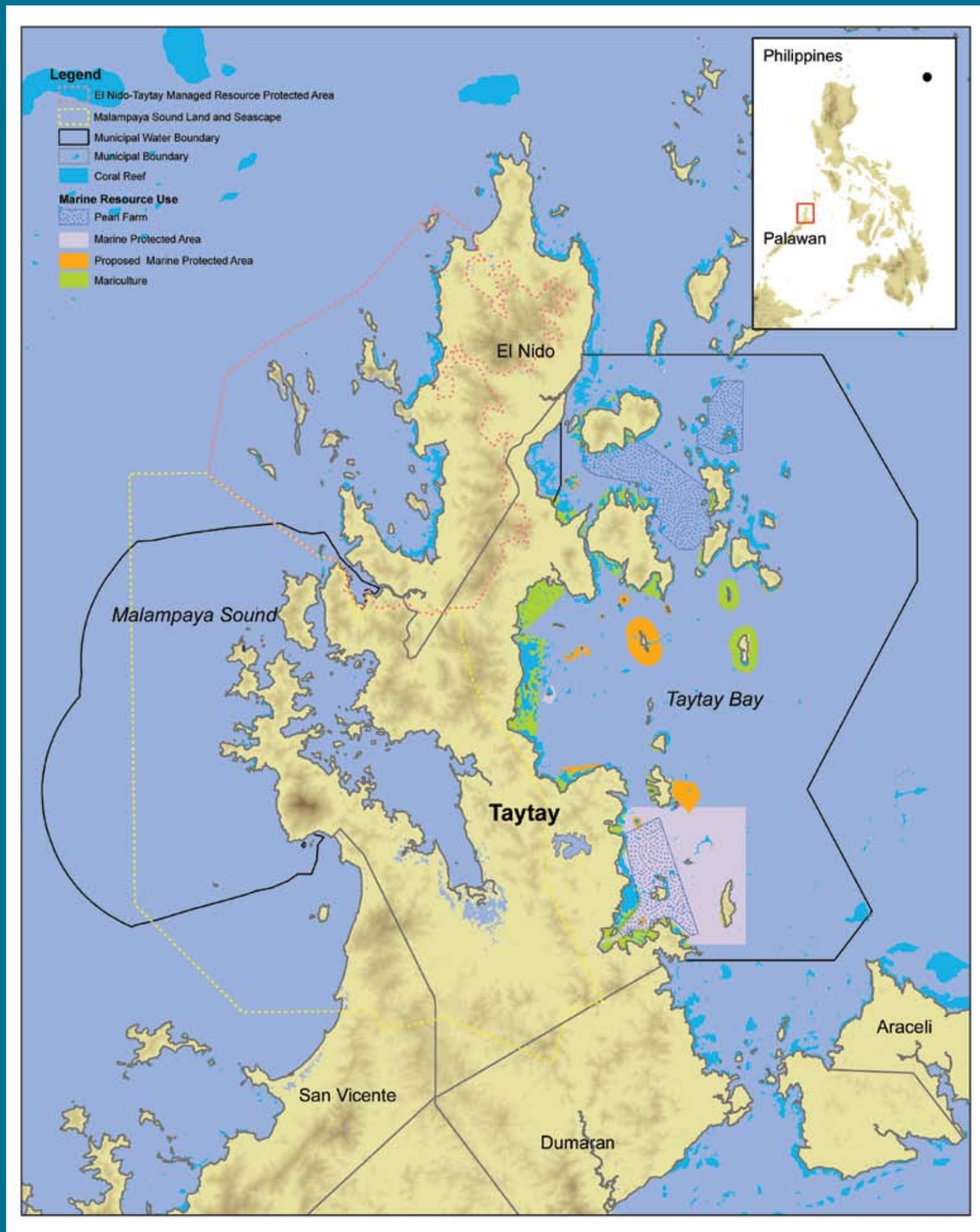
Guardhouse at Tecas Reef, an MPA managed and guarded round the clock by the municipality.

The lesson from this event was that even 100 percent protection against encroachers for an MPA like Tecas offered no guarantee that the coral reef would not be decimated by other natural events such as coral bleaching. To the credit of the municipal government, their response to the situation was commendable.

First, when they learned that Black Rock Reef exhibited resilience in what was a massive coral bleaching event, and also happened to be a spawning aggregation site, the Municipal Council readily recognized that it was a good candidate for MPA status, and declaration of the reef as an MPA is now pending.

Taytay now has four MPAs with a total area of 26,000 hectares, with 3,000 hectares more of proposed MPAs. If all proposed MPAs are approved, the municipality would have 14.7 percent of Taytay Bay under protected status, excluding Malampaya. This almost meets the requirements of the Philippine Fisheries Code of 15 percent, and is much better than the provincial average of 7.9 percent. Since the supply of groupers is dependent on healthy coral reefs, an expansive MPA is the best bet for the industry to survive by protecting the source. This may not sustain the industry at its current extraction rate, but if the MPAs are well managed and protected as they should be, an equilibrium between the available stock and extracted volume may someday be reached.

Second, the municipal government maintained the nonstop presence of Bantay Dagat (sea patrols) in the guardhouse of Tecas Reef. Although it would be difficult to establish sole attribution, the observed abundance of grazers feeding on the algae that have covered the corals offered hope that Tecas would eventually be able to recover from the coral bleaching event of 2010.



Map of Taytay, with the resource use map of Taytay Bay.

III. Moving A 'Win-Win Situation' Forward: Lessons Learned and Challenges Faced

Sleeping coral trout ready for sorting and shipping.

The story of Taytay is by no means finished. In fact, with the challenges ahead, there are no guarantees that it will be successful in its endeavor to make LRFT sustainable. In spite of all the fisheries management initiatives in Taytay, the elephant in the room is that at present, nothing is being done to reduce fishing pressure, particularly on the coral trout. Making MPAs of spawning aggregation sites and regulations on fish cages are good, but they will not be able to prevent the collapse of the fishery if fishing pressure remains unabated. Reducing fishing effort is politically suicidal and logistically impossible, given the resources of the Philippine government and the geography of the country. What hangs in the balance, however, is the capacity of natural regeneration to supply the demand. Stakeholders seem to be pinning their hopes on aquaculture hatcheries being able to breed coral trout on a commercial scale, but there is no telling when that will happen.

In the meantime, the municipal government is doing what it can. What is clear is that it has jumped on the bandwagon of fisheries management, and as long as LRFT remains viable and vital to its economy, fisheries will remain a central issue, offering hope that the municipal government will remain steadfast and committed to the cause.

In Taytay's journey to where it is today, a few principles of implementation have evolved that seem to be working in its favor:

Reconciling the interests of economics and conservation

Perhaps the most important factor that LRFT has going for it is that it is in everyone's interest to make it sustainable. The end market may not care about environmental impacts or safety standards, and traders could always move their business to new sources, but there is no reason why the former would want to stop eating the fish, and for the latter, stable sources would be good for business.

However, in Taytay, there is very clear interest in being able to sustain itself as a source of LRFT, and to not just become another statistic in the trade's boom-and-bust cycle. It is an important source of livelihood for industry players and a significant source of income for the municipal government; thus, the government invests in fisheries management and MPA establishment in order to sustain the industry.

For the provincial and national government, although the option of a total ban on the trade is always at their disposal, lack of resources for effective implementation of such a ban would only push the trade into the black market. Taking small steps at managing the trade at the source, though still inadequate, is the more logical course of action, which is why a conservation organization like WWF is supporting this initiative.

The key here is that, since sustaining the LRFT is a common interest, the stakeholders are working together to find solutions to a very complex problem.

Targeted technical assistance and local partnerships

The relationship between the municipal government of Taytay and WWF Philippines, as of the writing of this case study, is 13 years old. Over this period, the municipal government has become the pioneer in fisheries management for a major source of LRFT. Over this period, WWF implemented seven projects in Taytay, the majority of which had been small and highly specific research projects. The two big projects, Irrawaddy and CTSP, also invested heavily in research.

The winning formula here is that research has not been conducted for research's sake, but because there is specific information needed in order to make management decisions. Since these projects were implemented over an extended

period, both parties were able to respond to emerging situations by identifying priority actions and developing new projects. This was particularly helpful in Taytay's case, where the municipality is doing pioneering work on LRFT management in Palawan, where there is no tried and tested formula. They have had to learn along the way.

In addition, Taytay is not attempting to do everything by itself, and it taps the expertise of other institutions. From the start, WPU and ELAC have been with WWF in the various data gathering activities conducted. Their contribution not only enabled stakeholders to make more informed management decisions, but more importantly, the municipal government — not only of Taytay, but of other municipalities, as well — realized that technical support is available within Palawan, making it more affordable and accessible.

On the part of the academe, the LRFT initiatives presented an opportunity where scientific information from the academe could directly influence management and policy. This was true not only for WPU, but also for the Marine Environment and Resources Foundation (MERF) and De La Salle University, through Dr. Licuanan, when the results of their monitoring on coral bleaching were used for better selection criteria and management of Taytay's MPAs. WPU also has an outreach mandate, but as a state university it has limited funding, so working with the municipalities and WWF through its several projects has been a win-win situation all around.

Harnessing local autonomy

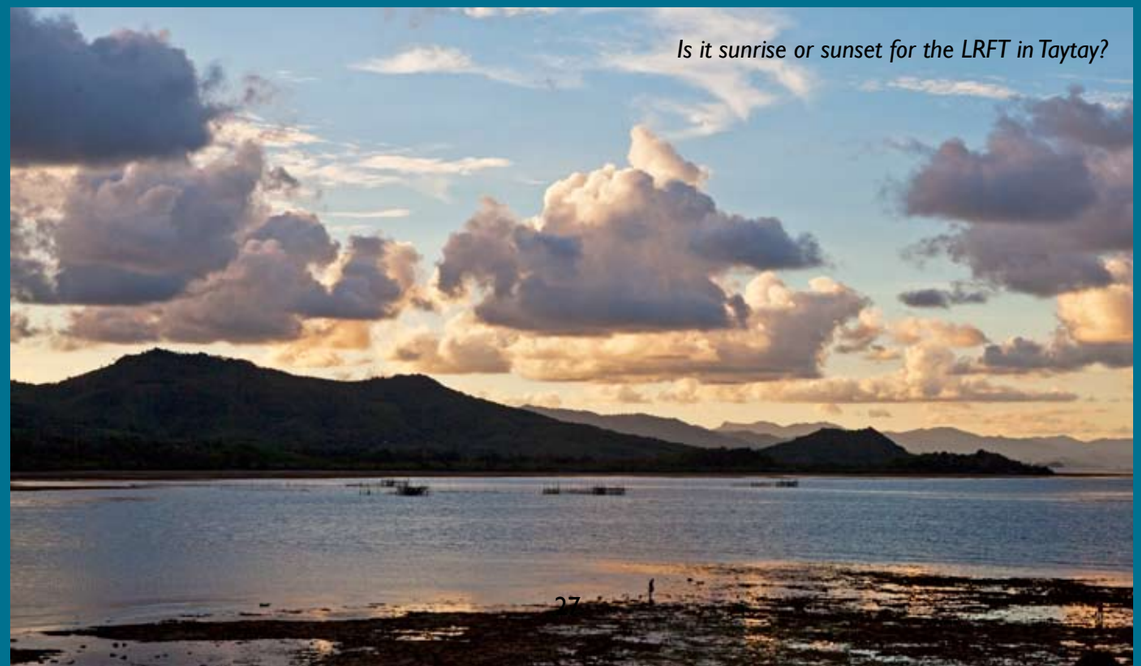
Aside from allowing for adaptability and programmatic intervention, the nature of WWF's presence in Taytay, with its intervals of small research projects and relatively bigger projects, meant that the municipal government's conservation or fisheries program did not become dependent on an institution with external sources of funding. Instead, it had its own program that it would tweak or enhance as pertinent new information was discovered. The municipality learned its lesson when the NIPAP project ended and the Protected Area Office was left without funding for operations. That the municipal government is generating funds internally and is able to support the operations of a national protected area and its own local MPAs is a feather on its cap that few municipalities can claim.

Also, because the municipal government has its own resources for fisheries management and conservation, it is better able to exercise authority over its municipal waters, as provided for by the national Fisheries Code. Its financial independence gives it a certain level of autonomy because it does not need to ask for funds from either the province or, say, the Bureau of Fisheries and Aquatic Resources of the Department of Agriculture (DA-BFAR) for its fisheries management program.

Conclusion: Leading the way

Taytay is not yet a conservation success story. Rather, it is a story of a local government finding a way to save a high value fishery that appears to be on the verge of collapse. It may be a race against time, but the government is doing what is within its means to accomplish — declaring and managing identified spawning aggregation sites and coral reefs that have shown resilience to climate change as MPAs, and developing implementable fishery regulations. In doing so, it harnesses partnerships with local institutions in order to make informed decisions. It is leading the way among all the municipalities in Palawan, the biggest source of live reef fish in the Philippines.

If Taytay is able to achieve its goal of maintaining its position as a major supplier in LRFT, it would not only light the path for other municipalities to follow. More important, it would be the first local government, in a developing country such as the Philippines, to break the chain of the trade's vicious cycle.



Is it sunrise or sunset for the LRFT in Taytay?

References

Bureau of Agricultural Statistics. *Fisheries: volume of production by subsector, by region and by province, 1980-2012 by provinces, subsector, year and quarter.* http://countrystat.bas.gov.ph/selection.asp [26 Apr 2013]

Cola, R., 2012. *The Tagbanua of Malampaya Sound: Conserving Nature as Lifeways.* Quezon City: New Day Publishers and WWF Philippines.

Cola, R., et. al, 2009. *Income profile of LRF fishers in Palawan and Tawi-Tawi.* Project report, unpublished.

IUCN Red List, 2012. *The IUCN Red List of Threatened Species, Cheilinus undulatus.* URL: http://www.iucnredlist.org/details/4592/0 [16 May 2013].

Matillano, M.V. et. al., 2008. *Study on the status of LRF industry in Biton, Taytay, Palawan.* WWF-Philippines report, unpublished.

Municipality of Taytay, Palawan, 2011. *Adaptation plan for the eastern Taytay using risk-based approach 2012-2020.* Workshop report, unpublished.

Municipality of Taytay, Palawan, 2009. *Municipal live reef fish for food trade: sustainability plan 2010-2020.* Workshop report, unpublished.

National Statistical Coordination Board. URL: http://nscb.gov.ph/activestats/psgc/province.asp?provcode=175300000&regName=REGION%20IV-B%20(MIMAROPA) [09 May 2013].

National Statistics Office. T*otal population by province, city, municipality and barangay: as of May 1, 2010.* URL: http://www.census.gov.ph/sites/default/files/attachments/hsd/pressrelease/MIMAROPA.pdf [11 July 2013]

Palawan Council for Sustainable Development. *The Malampaya Sound Land and Seascape Protected Area.* URL: http://www.pcsd.ph/protected_areas/malampaya.htm [08 May 2013]

Project Mirror, 2011. *Impact of mass coral bleaching and crown-of-thorns sea stars on selected reefs in the Philippines.* Project report, unpublished.

Province and Municipalities of Palawan and the City of Puerto Princesa, 2013. *Palawan Marine Protected Area (MPA) network framework plan 2013-2017.* Workshop report, unpublished.

Provincial Government of Palawan. *Historical Background.* URL: http://www.palawan.gov.ph/palawan-info.html [09 May 2013].

WWF Philippines, 2003. *Integrated Irrawaddy Research & Conservation Program, Malampaya Sound, Palawan.* Project report submitted to Shell Philippines Exploration B.V.