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FISH PRODUCTION COOPERATIVE SOCIETIES OF COZUMEL AND VIGIA CHICO

Mexico

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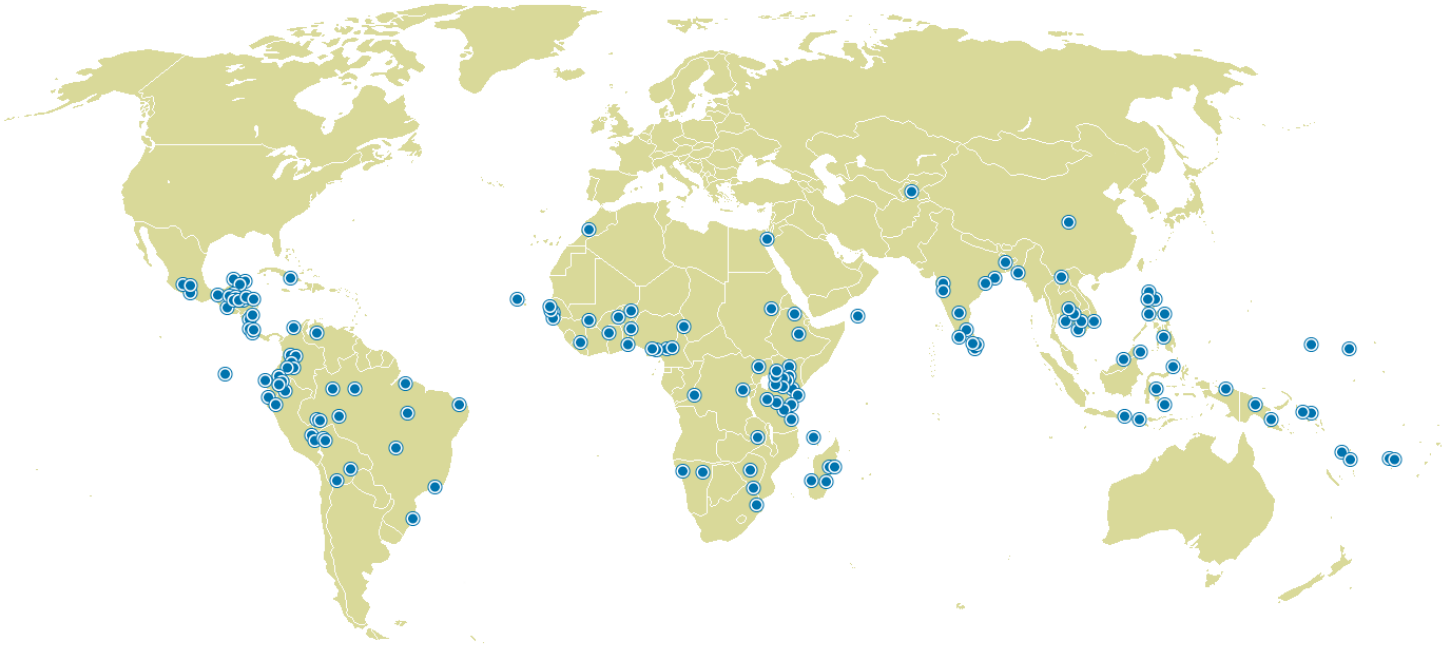
Local and indigenous communities across the world are advancing innovative sustainable development solutions that work for people and for nature. Few publications or case studies tell the full story of how such initiatives evolve, the breadth of their impacts, or how they change over time. Fewer still have undertaken to tell these stories with community practitioners themselves guiding the narrative.

To mark its 10-year anniversary, the Equator Initiative aims to fill this gap. The following case study is one in a growing series that details the work of Equator Prize winners – vetted and peer-reviewed best practices in community-based environmental conservation and sustainable livelihoods. These cases are intended to inspire the policy dialogue needed to take local success to scale, to improve the global knowledge base on local environment and development solutions, and to serve as models for replication. Case studies are best viewed and understood with reference to '*The Power of Local Action: Lessons from 10 Years of the Equator Prize*', a compendium of lessons learned and policy guidance that draws from the case material.



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THE FISH PRODUCTION COOPERATIVE SOCIETIES OF COZUMEL AND VIGIA CHICO

Mexico

PROJECT SUMMARY

The Fish Production Cooperative Societies of Cozumel and Vigía Chico works to advance a model of sustainable fishing for local communities. Located on the tropical island of Cozumel, an international tourist destination, and in the Sian Ka'an Biosphere Reserve, a national park and UNESCO World Heritage Site, the cooperatives have a long history of collaboration dating to the 1960s.

Today, the two cooperative societies coordinate their fishing activities off the coast of the island of Cozumel, with a particular focus on lobster and scaled fish such as grouper, cod, and snapper. Together, the cooperatives support their 128 members to acquire fishing permits, collectively manage marine resources, and engage in group decision-making, using grants from the UNDP/GEF Small Grants Programme to improve market supply chains and increase the abundance and diversity of endemic marine species.

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KEY FACTS

EQUATOR PRIZE WINNER: 2006

FOUNDED: 1960

LOCATION: Cozumel, Mexico

BENEFICIARIES: Cooperative members and their families

BIODIVERSITY: Sian Ka'an Biosphere Reserve

Background and Context

The Fish Production Cooperative Societies of Cozumel and Vigía Chico are two cooperatives working in the Mexican State of Qintana Roo to advance a model of sustainable fishing. The first cooperative is located on the tropical island of Cozumel, known best internationally as a tourist destination for snorkeling and scuba-diving. The second is located in the Sian Ka'an Biosphere Reserve, a national park and UNESCO World Heritage Site in the Yucatan peninsula. Both cooperatives focus on the sustainable harvesting of marine resources, with an emphasis on the Caribbean spiny lobster (*Panulirus argus*).

Evolution of two fishing cooperatives

The two cooperative societies have a long, rich history of overlap and collaboration. The cooperative in Cozumel was founded in 1960 at the initiative of a private contractor who was selling fish products and set out to organize fishers to improve coordination of harvesting activities and to increase production. The mobilized fishermen created a village called Maria Elena and concentrated their extractive activities on the Bay of the Holy Spirit. In 1968, a sub-group of the cooperative society decided to secede and start a new cooperative. These fishermen created the village now called Javier Rojo Gómez, but geographically known as Punta Allen and fished in the Ascension Bay, located directly adjacent to the Bay of the Holy Spirit. This group would become the cooperative society of Vigía Chico.

Coordinated lobster management

In 2001 and 2005, respectively, the Vigía Chico and Cozumel cooperative societies received independent grants from the UNDP implemented GEF-Small Grants Programme (SGP) to expand upon and improve their lobster fishing practices within the Sian Ka'an Biosphere Reserve. The cooperatives constructed artificial lobster shelters, a map of lobster fields, and a database documenting catch size and abundance, all as tools to ensure the long-term viability of lobster fishing in their respective regions. The grants also created two revolving funds, where individual fishermen could access resources to invest in their respective lobster fields. In 2005, the cooperative society in Cozumel also received a grant from SGP (for USD 30,000) to implement similar marine resource management tools: lobster shelters, fields and a comprehensive database. As their resource management practices and interventions came into closer alignment, the two cooperative societies decided to more formally link their work and collaborate in order to harmonize management plans, address common challenges, and chart a common vision for marine resource management in the region.

Today, the two cooperative societies coordinate their fishing activities off the coast of the island of Cozumel, with a particular focus on lobster and scaled fish such as grouper, cod, and snapper. The Cozumel cooperative has 48 members, while the Vigía Chico cooperative has 80 members. Together, the cooperatives support local fishermen to acquire fishing permits, collectively manage marine resources and engage in group decision-making. The general operating objectives are to develop sustainable fishing practices in the state of Quintana Roo, improve market supply chains in a manner that benefits local fishermen, strengthen the fishing sector by bringing local fishermen together, increase the abundance and diversity of endemic marine species, and raise awareness of internal and external fishing regulations. Each cooperative is governed by an executive board, which includes a president, secretary, treasurer and supervisor.

Key Activities and Innovations

The two cooperatives aim to sustainably manage marine resources in the region, with an emphasis on conservation of the Caribbean spiny lobster (*Panulirus argus*). This has been achieved through the creation and enforcement of a closed season, a four-month period between March and June, and the designation of recovery zones where fishermen are prohibited from catching lobster. Both actions have given lobster populations the opportunity to reproduce, regenerate and thrive, with positive results for both marine biodiversity and local livelihoods. Both cooperatives also organize fish markets, where local fishermen can (and are, in fact, required) to sell their products. This shared market platform helps the cooperatives stabilize prices and minimize the illegal sale of lobsters.

Cooperative activities employ artisanal fishing techniques; labour intensive methods that use simple technology and have low operating costs. Participating cooperative members use the lazo, an aluminum or wood rod with a noose that loops around the lobster's abdomen; the jamo, a hand net which is attached to an aluminum hoop; and the copo, a combination trawl and cone net device. These tools have been promoted as alternatives to hook fishing in an effort to encourage live lobster catches.

Lobster 'shadows'

Both cooperative societies have created artificial shelters called lobster 'shadows'. These shelters enable fishermen to capture the lobsters live, as opposed to the hook system which was used previously and which killed the lobsters in the process of the catch. Capturing the lobsters live permits fishermen to choose which will be removed for sale and which will be released back into the ocean until they have reached maturity and/or had a chance to reproduce. The shelters have the additional benefit of protecting the lobster population from some of their predators. Harvesting from these shelters requires teams of two: one to lift the shelter, and another to remove the lobsters with a butterfly net. Size limits are regulated to ensure only mature adult lobsters are removed and that egg-bearing females are released. Transgression of community rules carries steep fines of USD 100 per lobster. More than 90% of current lobster catch comes from the 'shadows'.

Lobster fields and resource mapping

Marine resources are managed through a number of community-based regulatory systems that control and administer access and use, notably including 'lobster fields'. This designation assigns individual or small groups of fishermen a territory which is their exclusive domain and in which they have both exclusive rights to fish (and place lobster shadows) as well as responsibilities to monitor the area

for transgressors and incursion. Unauthorized fishermen caught in a lobster field other than their own have their equipment confiscated, are stripped of their community fishing rights, and are expelled from the cooperative. Lobster fields are demarcated by buoys; a visual system that is further complemented by GPS mapping. Coordinates are taken and processed in a remote sensing laboratory at the Center of Investigation and Advanced Studies, Mérida Unit (CINVESTAV, Unidad Mérida). This information is then used to map lobster fields and the positioning of 'shadows' within each.

This mapping exercise has been valuable not only in coordinating the activities of participating cooperative members, but also in monitoring changes in marine resources. Information collected through community mapping is inputted into a central database, which helps to harmonize fishing practices in the Bay of the Holy Spirit and Ascension Bay. Collected information includes fishermen's name, number of the lobster field where the catch took place, the number of 'shadows' checked before a catch was made, the number of fishermen involved in the catch, and the time and date the catch was made. This information has provided the cooperatives with data to perform analysis, which in turn allows them to improve their efficiency, productivity and accountability to one another.

Lionfish

Each cooperative is also engaged in the capture and sale of lionfish (*Pterois*), a venomous fish characterized by red, white and black bands and spiky fins. The cooperatives have been active in promoting the lionfish as an edible species that can be sold in local markets and which can provide local fishermen with a viable economic alternative and a supplementary source of income. The lionfish is also an invasive alien species, so increasing the demand for the fish by making it a viable commodity is also helping to promote marine biodiversity conservation. Lionfish are known to overpopulate reefs, display aggressive tendencies towards other fish, and to consume other aquatic species (including lobster and crab), throwing off the balance of reef ecosystems. It also has no predators to naturally control the population.

Rotating fund

Both cooperative fishing societies operate a rotating fund, or what they call a community trust fund. The fund is endowed by individual cooperative members, who pay into it as part of membership dues. It also provides a funding target for external donors. The respective funds were launched with funds provided by the UNDP implemented GEF-Small Grants Programme. The funds allow individual fishermen to purchase upgraded equipment and technology (for example, concrete lobster shelters) and also provide a social service function, giving fishermen a financial buffer in times of financial difficulty, resource scarcity, and natural disasters. (The latter has been important, as the region is frequently hit by hurricanes.)

Capacity building and trainings

Members of each cooperative society have access to capacity building and training on marine resource management, financial planning and running a profitable fishery. Workshops emphasize the biological and economic importance of respecting closed seasons and sanctuaries, and educate community members on the legal size lobsters must be when they are caught. Outreach, environmental education and training are also provided to local youth on the functioning and governance of the cooperative and the principles of responsible environmental stewardship. This focus on youth serves two functions: first, to instil a conservation ethic in future generations, thereby ensuring the long-term sustainability of marine resources; and second, to train new members and young leaders in management positions, thereby ensuring institutional sustainability for the cooperatives. The cooperatives are in the process of creating an 'education department' that will enable members to share their experiences peer-to-peer with fishermen from other regions of Caribbean.

"Decisions on natural resource management must ensure careful consideration for the natural replenishing capacity of ecosystems and individual species. If resource extraction is necessary, it must be carried out in a sustainable way."

Lizabeth Tamayo, Fish Production Cooperative Societies of Cozumel and Vigia Chico

Impacts

BIODIVERSITY IMPACTS

The work of the two cooperative societies has had positive impacts on marine biodiversity in the region. In an area that was previously plagued by destructive fishing practices, unsustainable harvesting techniques, overfishing, and a tendency to capture immature fish before they had an opportunity to reproduce, the cooperatives have introduced a marine resource management system that is more respectful of natural regeneration needs and ecosystem integrity. The results have been positive both for lobster populations and the wide variety of scaled fish that inhabit the waters of the Bay of the Holy Spirit and Ascension Bay. By preventing overfishing and allowing marine species to reach adulthood, the cooperatives have facilitated natural reproductive patterns, which have in turn increased species abundance.

One of the most effective systems for biodiversity conservation and rejuvenation has been the implementation of closed seasons, where from March to June fishermen are prohibited from fishing for lobsters, but are still able to harvest grouper, prawns and other scaled fish. Comparative analyses over the past three closed seasons show that, when fishermen respect the seasonal no-take zones, overall production has increased. In 2011, for example, production and catch size doubled that of the previous season. Both cooperatives have also used this model to restore conch (*Strombus gigas*) populations, another species in need of protective measures. Closed seasons are complemented by fish and lobster sanctuaries in areas identified as high-risk of overexploitation or in need of replenishment. These sanctuaries provide a safe haven, allowing fish, lobster and conch species to fully develop and repopulate the area. The use of artificial shelters (or 'shadows') in the place of hook fishing has also enabled local fishermen to capture live lobster, allowing them more discretion in only harvesting adult lobsters that are of legal size.

The cooperatives have also introduced the use of concrete rather than palm as construction material for lobster shelters. This has had a positive impact on local biodiversity, in particular for the local palm known as chit (*Trinax radiata*). Previously, lobster shelters were made with chit stems, leading to extensive overharvesting of the palm and its subsequent classification as an endangered species. When the Sian Ka'an Biosphere Reserve was created in 1986, the use of chit was banned. Lobster fishermen were forced to find new material to build the shelters. Finding a viable alternative was a trial and error process, eventually leading to the development of a successful shelter prototype made of concrete. The Vigía Chico cooperative was the first to pioneer this model, a best practice that was quickly transferred to the cooperative in Cozumel. This switch to concrete has greatly reduced local use of the endangered palm species.

"It is important to carry out a full assessment of a resource before undertaking a conservation project. You must understand the relationship between species in an ecosystem before attempting any interventions."

Lizabeth Tamayo, Fish Production Cooperative Societies of Cozumel and Vigia Chico

SOCIOECONOMIC IMPACTS

Local livelihoods and incomes have improved for local fishermen due to a combination of cooperative interventions, notably including the harmonization of fishing regulations, collective marketing activities, and the adoption of locally appropriate technology. Prior to formation of the cooperatives, no clear rules were in place to regulate marine resource access and use. Fishing was conducted in a free-for-all manner, often leading to overharvesting, inefficiencies and resource conflicts. There was competition between lobster fishermen for the most productive 'shadows', but no method in place for subdividing fishing areas in an equitable manner. This led to conflict and disharmony in the fishermen community. Through the creation of designated lobster fields, fishermen now have exclusive rights to fish in specified areas, which in turn has increased efficiency and reduced conflicts.

Prior to creation of the cooperatives, there was a similar organizational vacuum for the sale and marketing of marine products. Under the current cooperative society model, all members (without exception) are obligated to deliver their catch to the cooperative collection center for measurement and merchandizing. This arrangement has ensured uniformity in lobster and other marine resource prices, benefiting both sellers and consumers by providing more certainty. It has also helped eliminate the practice of illegal lobster sales. Most recently, the two cooperatives partnered with four other fishing societies in the southern part of Sian Ka'an to form Integradora de Pescadores de Quintana Roo, a collective platform for marketing sustainably harvested lobster to retailers in the hospitality industry. This has enabled local fishermen to circumvent middlemen who previously charged a high premium for their services.

The cooperatives have provided local fishermen with economic stability, increasing incomes, facilitating access to a community trust fund, and improving financial and natural resource management capacities. Members earn a monthly income of approximately USD 300 from selling their lobster catch to the cooperative. They also earn additional income from selling other fish over the course of the year, notably during the four-month lobster closed season. The use of lobster shelters has contributed to increases in local incomes, as expressed by increases in metric tons of production. In 2008-2009, the cooperative produced 395.25 lobster tails and 7124.60 live lobsters. In 2009-2010, 4552.82 lobster tails and 10137.86 live lobsters were produced. In 2010-2011, 8494.18 lobster tails and 25891.21 live lobsters were produced. The community trust fund has been an additional source of financial security. Cooperative members can access the fund during lean periods or pronounced periods of economic need. This has been a particularly valuable security blanket in recovery periods following natural disasters. The decision to access the funds is taken democratically, at which point the resources are distributed equally among all members. In more steady economic periods, fishermen can borrow from the fund at low interest rates to upgrade fishing equipment such as boats, motors and nets.

The cooperatives have also succeeded in diversifying local and economic activities. Ecotourism, for example, has become a significant source of employment and income, particularly during the off-season. Four tourism cooperatives have formed our of the fishing cooperatives, which offer visitors sport fishing, snorkelling, bird watching, and dolphin-sighting tours.

Sustainability and Replication

SUSTAINABILITY

The two cooperatives have showed a great deal of economic, political and environmental resilience since their founding in 1960s. Their longevity can be attributed to their collective ability to react and respond to system shocks. The most literal manifestation of this resilience has been in the face of natural disasters, most recently in the wake of Hurricane Wilma, which devastated coral reefs in the region in 2005. The cooperatives were indispensible in this period, providing local fishermen with a social and financial safety net, allowing them to replace destroyed boats, lobster shelters and other local infrastructure. The community trust fund was created with a grant from the UNDP implemented GEF-Small Grants Programme. Since then, members pay into the fund regularly and are allowed to dip into the fund in times of financial hardship. Following the natural disaster in 2005, the community trust fund helped local fishermen to rebuild 2,130 lobster shelters, functionally re-establishing the lobster fishing industry and saving it from the brink of collapse.

The cooperatives have also worked to improve their financial management capacity with a view to ensuring long-term sustainability. In 1988, the Vigía Chico cooperative lost a major asset when the bank seized its seafood processing plant, causing a severe crisis. That same year, Hurricane Gilbert hit the north of Quintana Roo, destroying countless lobster shadows and causing outmigration to urban centers. The cooperatives were unable to pay their debts, and economic recovery was slow for several years. This process gave the cooperative a heightened appreciation for the value and necessity of good financial administration and governance. The cooperatives now source out management of their incomes and expenses to a private accounting firm to ensure the sound and effective handling of its financial affairs.

The consolidation of lobster marketing through Integradora de Pescadores de Quinana Roo has provided an additional mechanism for ensuring the long-term sustainability of the initiative. The

cooperatives now have a direct market supply-chain link to the ecotourism and hospitality industries, providing a predictable and consistent demand for lobster products.

REPLICATION

Other fishing cooperatives in the state of Quintana Roo have been modeled after the two cooperatives, including José María Azcorra and the Tulum Cooperative. Since these two cooperative were established, there has been ongoing knowledge exchange, and peer-to-peer site visits. This has allowed for the transfer of best practice and lessons learned across communties, which ultimately has benefits for local economies and biodiversity. The cooperative model advanced in Cozumel and Vigía Chico has also been promoted throughout the Caribbean. Conferences, seminars, workshops, and field visits have provided opportunities for the cooperatives to exchange ideas, lessons, methodologies and experiences with fishing communities from Mexico, Belize, Honduras, Guatemala, Cuba, the Dominican Republic, Panama, and the United States. As one example, in 2008, a group from the Dominican Republic (called Reef Check) visited the cooperatives for a six-day learning mission on closed seasons and ecotourism activities. The cooperatives conducted demonstration activities on the constructio of lobster shelters and held a fly fishing workshop, among other trainings on coral reef monitorin and ecological assessments of reef health. These exchanges motivated creation of a commission for knowledge exchange and a partnership for the regional management of fisheries in the Mesoamerican Reef System.

PARTNERS

The cooperatives have fomented partnerships with several research centers in the region, which assist primarily in monitoring and evaluation and ecological assessments. Notable research partners include the Fisheries Department of the Southern Frontier School College, which studies performance of the lobster fishery; the Center of Investigation and Advanced Studies, Mérida Unit (CINVESTAV, Unidad Mérida), which coordinates ecological assessments of ocean floor habitats and their relation to the spiny lobster fisheries; and Ascension Bay, Sian Ka'an Biosphere Reserve. The cooperatives have also forged partnerships with various levels of government. Federal, state, and municipal governments have provided capacity building, technical and resource support, including the purchase of engines, boats, and refrigerators. The UNDP implemented GEF-Small Grants Programme has been instrumental in providing catalytic funds for community level work. Further partnerships have been forged with the United Nations Foundation, the GEF-SGP Community Management of Protected Areas for Conservation (COMPACT) initiative, and Conservation International.

"Our communities have experienced climate change in the form of strong winds, higher temperatures and extreme weather shifts. We are also taking steps to adapt, including water conservation, recycling and energy management. We are committed to avoiding being part of unnecessary consumption."

Lizabeth Tamayo, Fish Production Cooperative Societies of Cozumel and Vigia Chico

FURTHER REFERENCE

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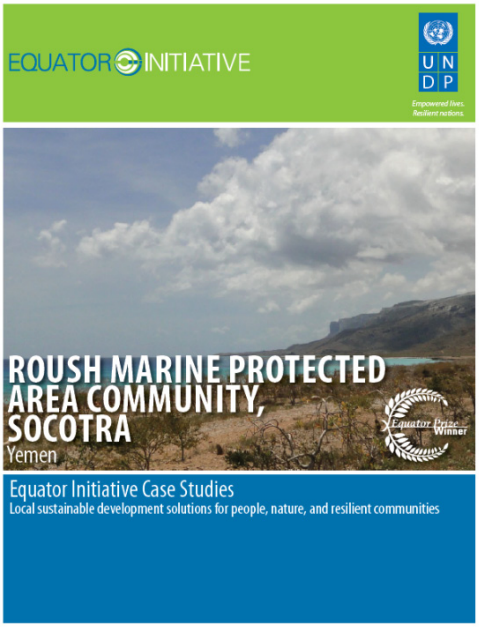

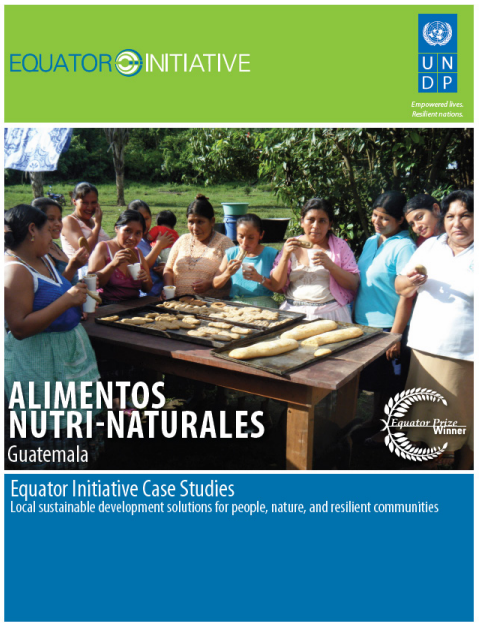

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