

Building household economic resilience to secure a future for near shore fishers in the Philippines

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ABSTRACT

Resilience has become a key concept for addressing the vulnerability of small-scale fishing households in developing countries. While effort has gone into defining the concept of resilience in relation to fishing households; very little application of the concept exists in practice. An economic resiliency strategy was developed that builds resilience through improved household assets to reduce risks and vulnerabilities. A foundational conclusion of the strategy is the importance of linking household livelihood interventions to sustainable fishing behaviors. The conservation enterprise approach facilitated a mutually beneficial relationship between biodiversity conservation and livelihoods.

1. Introduction

Few countries can boast marine environments that compare to the ecological richness and productivity of the Philippines' oceans. The country's waters contain almost ten percent of the world's coral reefs, large swaths of mangrove forests, and more marine protected areas than any other country [1]. These waters also provide for millions of Filipinos whose well-being is inextricably linked to the health and productivity of near-shore waters. More than 1.4 million small-scale fishers and their families rely on coastal waters to provide income and sustenance; with an average family size exceeding five people, this amounts to more than 6.5 million of the country's population being directly dependent on near-shore fishing for their well-being [2]. However, the production capacity of the ocean to continue to provide for Filipino families has been in decline since the 1970s [3]. A combination of rapid population growth, growing fishing effort, the introduction of destructive fishing practices, and weak fisheries governance, along with coastal habitat loss and degradation through development and pollution, has exacted a heavy toll on the health of coral reefs, seagrass beds and mangrove forests impacting the productivity of the country's fisheries.

Although municipal waters (waters extending out to 15 km from shore) cover just 15.3% of the Philippines' total Exclusive Economic Zone, they include the majority (78%) of the country's shallow waters < 50 m and 82% of the Philippines total coral reef area [4–6].

These shallow water reef systems provide critical fish habitat for important fisheries including anchovies and scads. Municipal waters are therefore crucial to national fisheries and currently support more than 85% of the country's fishers and generate half of the documented annual marine fisheries landings for the country.

Fishing is an unpredictable occupation and fishers are some of the most economically vulnerable people in the Philippines with one of the highest poverty rates in the country. Declining fish populations not only threaten fishers' income, but local food security and national food supply as well. The country's poor population is especially dependent on the sea with some estimates of the share of animal protein from fish for low-income Filipinos as high as 70%. Fishing households are further stressed by factors within fishery systems, as well as to ecological and social impacts outside their influence such as climate change, chronic pollution, resource degradation, fluctuating prices of commodities, conflicts over resource use that increase vulnerability and changes in management strategies that can asymmetrically effect different communities [7].

Resilience has become a key concept for addressing the vulnerability of small-scale fishing households in developing countries. Holling [8] defines resilience as “a measure of the ability of these systems to absorb change of state variables, driving variables and parameters and still persist”. This concept focuses on the capacity of an ecological system to absorb changes but still maintain its core function. For a fishing household, social resilience can be defined as “the ability

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of a household to absorb external changes and stress, while maintaining the sustainability of their livelihoods” [9]. Buckle [10] refers to resilience as the “capacity to withstand loss”. The concept of resilience has been linked to social-ecological systems [11–13] and for people, resilience can be considered to be positive and desirable. Walker et al. [14], provide a widely cited definition of the resilience of a social-ecological system as “... the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks ...”. A resilient fishing household should be able to evolve in response to changing stresses while maintaining its functionality even as capital (natural, financial, human, physical, social and institutional) are restrained.

While effort has gone into defining the concept of resilience in relation to fishing households; very little application of the concept exists in practice. In the Philippines, the international non-governmental organization, Rare, has been building resilient fishing households in conjunction with its Fish Forever program. The program has the overall goal to identify, pilot and scale approaches that improve social and economic returns of nearshore fisheries in a way that supports and creates greater incentives for conserving marine biodiversity and sustainable management of fisheries, while maintaining (and ultimately enhancing) the resilience of fishing households. This paper presents a description of Rare’s economic resiliency strategy, the activities undertaken through the program, and outcomes achieved. The paper concludes with lessons learned from the program and implications for linking markets to sustainable fishing behaviors.

2. Harnessing markets for sustainable fisheries

Rare Philippine’s economic resilience strategy as part of the Fish Forever program is anchored on addressing the multi-faceted issues of overfishing [15]. In the country context, overfishing is closely linked to the high incidence of poverty, especially among coastal fishing communities. Fisher households are among the poorest segments of the Philippine population and are very vulnerable to crises and shocks given their high dependence on fishing for food and livelihoods. The inherent vulnerability of fisher households is further impacted by external shocks such as natural disasters and slower onset changes such as those associated with shifting market prices, or costs such as fuel.

The Philippine Fish Forever economic resiliency strategy builds resilience through improved household assets to reduce risks and vulnerabilities. With improved household resilience, the fisher family should be able to deploy their capital and assets to better address crises and shocks and will increase the incentive for fishers to help conserve fisheries and marine resources. The theory of change is that improvements in household resilience will therefore lead to reduced threats to marine biodiversity, greater social protection and increased income potential. Since household asset building is multi-dimensional, the economic resilience strategy focused on building financial and social assets to complement the broader Fish Forever aim of conserving the natural capital – fishery resources and the habitats that support them.

Building household assets focuses on providing supplemental livelihoods to the fisher households through the development of local businesses associated with the existing fish supply chains or establishing new market opportunities for existing fished species. The program focused on supplemental livelihoods rather than alternative livelihoods as supplemental livelihoods have less risk and can show faster impacts [7]. By providing and improving livelihood and income opportunities through enterprise and market interventions associated with local fisheries, fishers the aim is to increase the positive “benefits exchange” for fisheries to support the fisheries management interventions being introduced in parallel. In the process of testing different market-oriented fish businesses “conservation enterprises”, the strategy also aims to develop turnkey solutions that will support scaling-up of the successful initiatives in other communities.

Rare Philippines was given an opportunity to test the economic

resilience strategy through a grant provided by the United States Agency for International Development (USAID) through its Global Development Initiative (GDA) for a project entitled “*Harnessing Markets to Secure the Future of Near Shore Fishers*” [16]. The project had the overall goal to identify and pilot approaches that improve social and economic returns of near shore fisheries in a way that supports and creates greater incentives for conserving marine biodiversity and sustainable management of fisheries, while both maintaining (and ultimately enhancing) the livelihoods of fishers and those directly and indirectly dependent on their income. The project addressed this goal through several activities:

1. Understand the nature, scope and landscape of livelihoods in the Philippines that are directly and indirectly dependent upon near shore fisheries.
2. Determine and test basic methods of stabilizing and/or increasing local fishers’ income through cost efficiencies and/or quality improvements that allow fishers to retain more value.
3. Explore and test the viability of fishery enterprises tied to managed access + reserve management, which can supplement income during reduced effort and build business capacity in preparation for fishery recovery.
4. Explore and test viability of market ‘pull’ strategies that can yield more revenue for fishers by linking sustainably managed fisheries to the appropriate domestic and export markets.
5. Build local capacity to successfully implement/participate in fishery improvements, enterprises or market interventions.
6. Exploring initial pathways to scale for all of the above objectives by identifying, strengthening and facilitating structures, enabling policies and partnerships through which private capital and/or government may drive uptake of potentially successful models, and by which community fishery management capacity can be augmented efficiently.

3. Methods

Project activities began in October 2015 in seven municipalities/sites in four provinces of the Philippines – Occidental Mindoro (Looc and Lubang), Camarines Sur (Tinambac), Surigao del Sur (Cantilan and Cortes) and Negros Oriental (Ayungon and Bindoy) (Fig. 1). These sites were chosen because they represent a mix of Fish Forever sites, Marine Key Biodiversity Areas (MKBA), and community need and partner capacity. They comprise a range of cultural, geographic and biodiversity characteristics in the country. They are also based on a cluster strategy, wherein local government unit partners are clustered near each other in order to enhance widespread adoption of the Rare *managed access + reserve* model and enable network effects.

The project employed three overlapping phases to identify, implement, and pilot scale approaches that improve the profitability and sustainability of fisheries while reducing stress on the fishery and maintaining the livelihoods of fishers and those directly and indirectly dependent on their income (Fig. 2). Though all three phases were essential, the outcomes of Phase 1 was used to inform and refine the second and third phases. The results of the research helped to determine a suite of focused activities that were applicable at the sites (depending on prevailing conditions) while also identifying a broader enabling environment and capacity-building work plan that identified key gaps that the project would address in Phases 2 and 3.

Phase 1: Research – to gain a better understanding of the range of livelihood, value chain, market and development support interventions that may be combined with ecosystem-based managed access fisheries as a means to secure fisher incomes and allow a scientifically determined reduction in fishing effort so that productivity improves toward maximum sustainable yield. A series of interconnected analyses were undertaken to map and understand the nature, scope, landscape and gendered aspects of livelihoods in Filipino communities directly

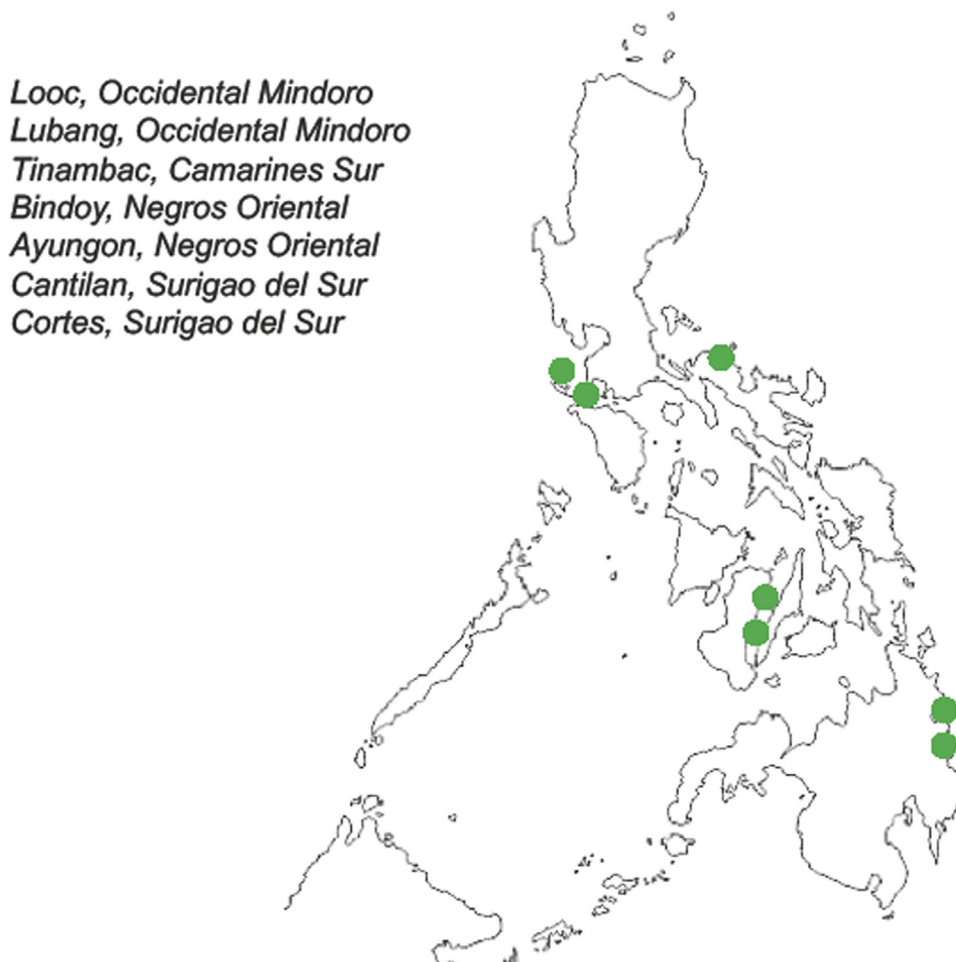


Fig. 1. Location of GDA project municipalities in the Philippines.

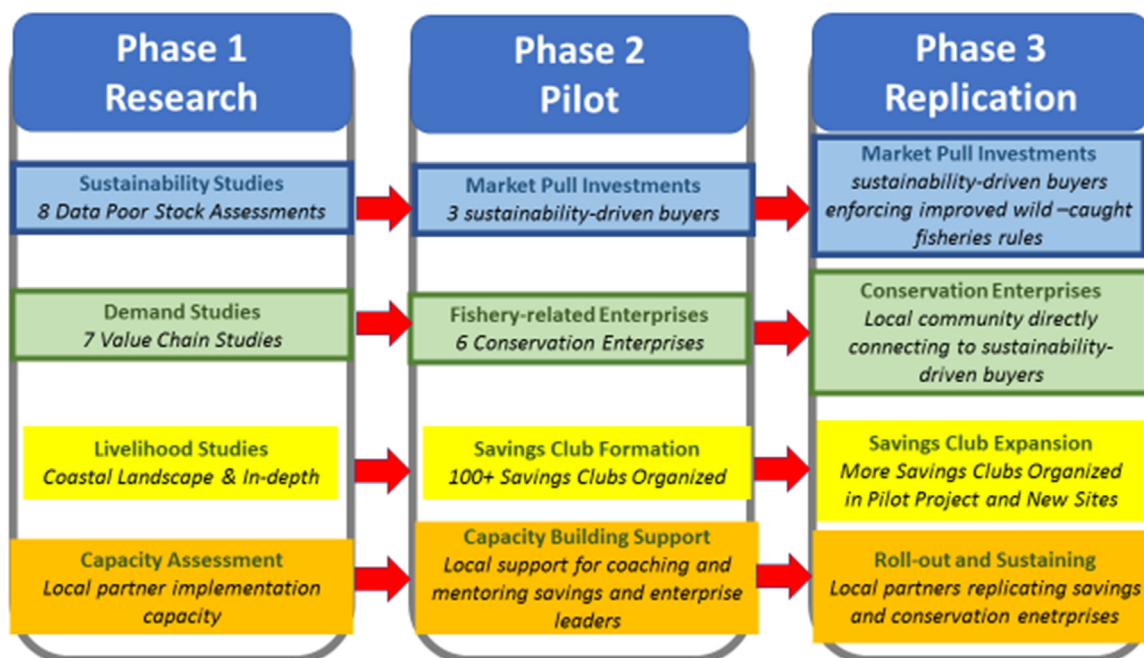


Fig. 2. Path Diagram of Project Phases.

and indirectly dependent upon near shore fisheries and to deepen an understanding of markets and fisheries resources at these sites. Phase 1 was undertaken through three research analyses:

- Coastal Livelihood Studies - Landscape overview of livelihood projects in coastal communities over the last 30 years and an in-depth analysis of selected livelihood projects with project implementers and recipients.
- Stock Assessments – A critical step before enterprise development to determine which species at each site are viable for marketing, plus any measures that need to be in place to ensure sustainability. The stock assessment included information on fishing gear types, fishing effort, catch rate, fishing area, catch composition, and trends in the fisheries.
- Value Chain Studies and Process Mapping - Identify market opportunities and areas for improved practices within the supply chain.

A Participatory Coastal and Fisheries Resource Assessment (PCFRA) was conducted at each site [17]. PCFRA is a research- and survey-based resource assessment from the perspective of local users, integrating local knowledge with scientific technical expertise to provide guidance in coastal resource and fisheries management. It provides site-specific data that feeds directly into fisheries management, including information on the coastal environment, resources, and the people who rely on them.

Phase 2: Pilot and Replication – identify and engage local organizations as partners to develop several promising approaches toward supplementing fisher livelihoods. Several livelihood interventions were developed and implemented at the sites. The objective was to determine potential impact on the sustainable management of fisheries through the uptake and compliance with fisheries management strategies including both area-based plans and harvest control rules, while also determining the need for capacity-building programs and supporting their subsequent development at the site level. The interventions included:

- Savings clubs - Built the capacity of fishing community members to form and operate savings and business groups.
- Fishery practice improvements – Developed and tested postharvest fish handling and processing methods of stabilize and increase local fishers' income through cost efficiencies and quality improvements that allow fishers to retain more value.
- Fishery related enterprises – Developed and tested three fishery-related business models that support sustainable fisheries management and biodiversity conservation including social franchising, fresh seafood sourcing, and seaweeds community production.
- Market “pull” investments – Developed and tested market ‘pull’ strategies through organizing and preparing fishers to meet market requirements and linking to markets and test marketing responsibly caught products.

Phase 3: Initiating Widespread Adoption – widen the base of municipalities that engage in sustainable marine and fisheries management by scaling the capacity, enterprise and market interventions, as well as innovative business models, which prove to be successful drivers of this behavior in Phase 2.

4. Results

4.1. Phase 1

The three research analyses conducted under Phase 1 of the project provided results which informed the design of Phase 2. The timeframe for Phase 1 was October 2015 to November 2017. The landscape overview of livelihood projects in coastal communities was conducted from January to June 2016 and an in-depth analysis of selected

livelihood projects was conducted from July to September 2017. The stock assessments were conducted from January to June 2016. The value chain analyses were conducted from January to June 2016. Several workshops were held to present results of the studies.

The coastal livelihood overview provided lessons learned from previous or ongoing fisheries livelihood projects that had been implemented in the Philippines over the last 30 years. The coastal livelihoods analysis found that: the provision of livelihoods is supply-driven; there is a lack of engagement with beneficiaries in design of projects, resulting in low buy-in of target beneficiaries; there is lack of adequate social preparation and technical assistance; and there is little flow of information and lessons learned from one project to another [18]. The coastal livelihoods studies concluded that development of livelihoods should seek to address the root causes of vulnerability of fishing households and communities and to build their resilience to future threats, as well as their capacity to exploit opportunities. The approach is not only about giving people jobs; it requires addressing fundamental social, economic and environmental reforms that affect fishing communities and livelihoods. Achieving progress in this direction means those providing assistance must engage fishing households and communities in a dialogue about the future they envision, the steps needed to get there, and the lessons learned along the way. This more holistic approach requires engaging a broader array of actors across government, civil society and the private sector to build both understanding of the reforms needed and the commitment to undertake and sustain them.

The original intent of the project was to identify new markets for responsibly-sourced seafood from the selected communities. It was not sufficient, however, to look at the market demand for target species in isolation, but to also evaluate the supply side in terms of the status of the target stock. This was critical in order to avoid or reduce the negative impact of demand driven overexploitation on the target species. A key target was to ensure that the project did not lead to increased fishing pressure on the already “vulnerable” species. The partner municipality or local government unit (LGU) and the local community members selected the target species for the project based on their economic, social, and ecological importance to the communities. The species selection was complemented and validated with data from Participatory Community Fisheries Rapid Appraisal (PCFRA) studies previously conducted in all Fish Forever sites [17]. The PCFRA provided the baseline information on fishing and fishing practices in the community and how they affect social, economic, and ecological decisions. A data-poor stock assessment was conducted which yielded information on stock status for each target species and recommendations for appropriate fisheries management for the target species [19]. This assessment was conducted in the seven (7) project sites and one additional site (Culasi, Antique) and covered twenty-seven (27) target species.

The data-poor stock assessments found that the stocks of several of the target species could not take increased fishing pressure to meet an increased market demand and that many of the target species were being caught as juveniles. The stock assessment also determined that many of the target species will be vulnerable to the impacts of climate change. It was recommended that certain target species be excluded from any market intervention and placed under improved fisheries management. The stock assessment also recommended that other target species could be harvested as long as they met minimum size limits for that species. The study further suggested for the sites to review their fisheries management plans and methods in order to protect vulnerable species. These species would only be connected to new markets when appropriate fisheries management actions to achieve a sustainable fishery had been taken by the sites. Additional and continuous stock catch monitoring was proposed for all sites in order to ensure that any increased fishing pressure to meet market demand does not have a negative impact on the target species stock.

The value chain study looked at twenty-one (21) species from the

six sites. There were common species assessed in the study, including rabbit fish (*Siganidae*), flying fish (*Exocoetidae*), squid (*Loliginidae*), anchovies (*Engraulidae*) and big-eye scad (*Selar crumenophthalmus*). Having common species was useful for both setting up similar fisheries management plans and helping achieve economies of scale for market connection. There was little existing value addition along the value chain for most species mainly due to the high cost of inputs along the value chain. The study found strong market demand and potential for value chain upgrading of these species especially rabbit fish, flying fish, anchovies, and squid. There is higher revenue potential for the fishers if harvesting and postharvest handling are improved to reduce losses and increase quality. Consolidation of small catch volumes is another strong recommendation from the study, to reduce transportation costs while increasing leverage in the market due to larger volume. Some target species were not to be pursued for further value chain support since it was determined that there was enough local demand and the importance of maintaining local food security.

This study found that fisher households are very vulnerable to crises and external shocks and have very few assets to cushion unexpected impacts. Fisher households rely on strong social capital and networks to manage their risks and reduce their vulnerabilities. The households were also found to have limited equity or investment capital and low skill levels for participating in many supplemental livelihood activities.

4.2. Phase 2

Based on the results of Phase 1 of the project, four activities were carried out under Phase 2, and a toolkit integrating all of the methods and approaches utilized in Phases 1 and 2 was prepared.

The activities of Phase 2 were able to be initiated relatively quickly as each of the selected sites were part of the larger, ongoing sustainable fisheries program of Fish Forever. Through the Fish Forever activities, there was already buy-in and support from local government leaders and community members for sustainable fisheries management and the new project Phase 2 activities were easily introduced and undertaken without any major concerns or issues. A local Municipal Facilitator was hired for two, adjacent municipalities/sites to coordinate activities and work with local government officials and fishing households. In locations where difficulties were encountered due to both personal and political reasons, the members of the pilot savings clubs and conservation enterprise groups were able to demonstrate the benefits of the interventions and it became easier to communicate through the success of these early adopters and innovators.

The activities of Phase 2 began almost simultaneously in each site with the introduction of the project to local stakeholders and organizing the site teams from October 2015 to March 2016. Organizing and capacity building of savings clubs began in October 2016 and continued through the life of the project until February 2018, with the initial savings clubs supported from January through June 2017. Conservation enterprise groups were established beginning in October 2016 and support continued through the life of the project.

In order to begin to build fishing household resilience, village savings and loan associations (VSLA), were established as a turn-key solution. VSLAs have been successfully employed in Africa, as well as in some fishing communities in the Philippines and have been used to build household financial assets. The establishment of a savings club normally was undertaken through four, one hour training sessions over one or two days depending upon the availability of the group. This was followed by monthly visits (or more frequently as needed) and a final training on utilizing the savings.

The approach was able to mobilize more than PhP 14.5 million (US \$290,000) in savings over twenty-two months (as of March 2018) in 102 savings clubs with 2237 total members (female – 1693 (76%) and male 544 (24%)). The savings club approach enabled fishing households to save, invest, and establish social protections through emergency funds. The fishing households were able to use savings to keep

their children in school, purchase physical assets, and support existing or new supplemental livelihood activities. Some fishers were able to use their savings to reduce the negative impact of poor weather conditions on their ability to fish and their daily subsistence. Savings club members, as part of the savings group, were able to build stronger social networks to support livelihood initiatives and the clubs also provided an important forum for members to address broader community issues. The savings clubs also enabled the active participation of more women in fishery-related projects including Fish Forever. More than 70% of the savings club members were women and the majority of the leaders of the groups are women. Management of the savings clubs showcased the leadership ability of women towards helping their communities. Some local government units (LGU) partners were also able to connect savings clubs to help support local initiatives and projects.

Fish handling improvements along the fish supply chain can minimize post-harvest losses and waste and make fish safe for consumption, hence maximizing returns. Oftentimes, simple practices, like proper hygiene and sanitation, can be effective in adding value to fresh and processed fishery products. Improved practices can help fishers and market vendors benefit more from the fish they catch, process and sell. Also, the adoption of improved practices by fishers can result in better business and regional trade. Furthermore, implementing improved practices along the fish supply chain will not only increase fish and seafood supply for human consumption, through less wastage, but it can also reduce the pressure on the wild-capture fish stocks, resulting in higher sustainability. A social marketing campaign called C3 or “Cool, Clean, Care,” which was based on an existing training program by the same name by the Bureau of Fisheries and Aquatic Resources (BFAR), provided training and equipment to fishers to help improve post-harvest practices through icing, using clean water and equipment, and better handling of the catch to improved quality and reduce damage. Fishers were provided with coolers and buckets to ice and handle the catch. At one site, a pool of key-influencers on fishers were developed to work one-on-one with other fishers to practice C3 behaviors and market vendors were assisted in upgrading their stalls to improve fish handling and sale. The C3 campaign also aimed to increase the demand from consumers for responsibly and properly-handled fish. Some sites have increased the value and prices of some of their catch because the market appreciated the greater attention to quality and responsible fishing. This result further reinforces the behavior change adoption among fishers because of the premium they are receiving for their catch – higher selling price.

Three fishery-related business models that support sustainable fisheries management and biodiversity conservation were developed including: (1) social franchising, (2) fresh seafood sourcing, and (3) collective marketing.

4.2.1. Social franchising – establishing conservation enterprises from savings clubs

Social franchising is the application of the principles of commercial franchising to promote social benefit rather than private profit. The social franchising model was demonstrated in the dried fish business project. The social franchising model was developed and used to be able to develop a turnkey solution that can easily be replicated at other sites. The model was designed to scale up a successful business venture such as dried fish trading. The Conservation Enterprise Group (CEG) was developed as a delivery mechanism for this solution. A CEG is a collection of fishers organized to engage in business enterprise while committing to specific fishery conservation efforts. This means that while people in the local community are organized, developed and trained to run a business enterprise, primarily involving seafood-based products, the foundational principles of fishery management and habitat conservation connect to the business ethos in how to run such an enterprise. The organized group is strengthened to observe the set of practical rules for biodiversity conservation in the local area. Having business-minded individuals separates the CEG from the usual fisher

association where biodiversity conservation and protection is the primary objective. One of the challenges for sustainability of livelihood projects is the lack or limited buy-in from the participants, especially in providing their own capital to run the business. The capital mobilized by the savings clubs form the foundation for all the CEGs to start their own business. This was a key component of the Project's economic resilience strategy. The Project did not invest a single peso to capitalize the CEGs and the approach served as a mechanism to test the willingness of the participants to provide their own equity into the business. This resulted in fewer members of the CEG compared to the broader savings club, as some members did not want to invest.

The advocacy of the CEG for biodiversity conservation becomes a complementary objective which is different to the traditional approach of cooperatives, which mainly focus on the business enterprise operation. For example, the CEG was connected to premium seafood markets through a local social enterprise called Fishers and Changemakers Inc. (FCI). Products of the CEGs, specifically dried fish of various species from different sites, were introduced to FCI. To help differentiate the CEGs' responsibly-sourced seafood products in the market, Rare helped FCI develop a unique packaging. The back label of the packaging explains to buyers the importance of their patronage of responsibly-sourced seafood and its contribution to achieving sustainable fisheries. This is evidence of how markets can incentivize sustainable fishing practices. An informal agreement was entered into by FCI and the CEG, where the CEG delivered a part of their product to FCI using the packaging material, while FCI developed markets for and placed products in new markets. Across nine months of partnership with FCI, the participating CEGs were able to increase the value of their initial capital investment between 30% and 40%. A portion of the premium price was also shared with the fishers by buying their catch at a higher price. The partnership with an existing market player like FCI reduced the investment by the project on market development and enabled the fishers to quickly see benefits and increase their support for improved fisheries management.

Rare also explored other possible markets for the CEGs' products, and additional buying arrangements were being piloted by the end of the project. Working with the local government helped the CEGs tie up with government agencies such as the Department of Trade and Industry, Department of Social Welfare and Development – Sustainable Livelihood Program, and Department of Science and Technology, Bureau of Fisheries and Aquatic Resources – National Mariculture Center, so they could access business services from the agencies such as the purchase of solar driers, product development and various trainings on business and marketing.

4.2.2. The fresh seafood model

The fresh seafood sourcing model was developed to link fishers with new and higher value markets for their products. The value chain analysis studies revealed that fishers were getting the lowest proportion of the value from their products compared to middlemen. The lack of market information, especially price and potential buyers, were identified as market barriers for fishers. The fresh seafood sourcing business model aimed to help the fishing households increase their income by enhancing the value of their catch compared to their existing marketing schemes and by connecting them to premium markets so they could receive better prices. This model also offers incentives, through market access, to fishers who practice sustainable fishing. The partners in the model include the fishers, the CEG, the primary buyers, the LGU, the premium market actors, and consumers. The CEG sources and aggregates fish from the fishers, who may or may not be CEG members. The CEG is responsible for selling the fresh seafood products. It also provides capital, through the savings club, to the fishers and manages income sharing among members. Existing primary buyers are integrated into the business model to purchase and assemble fish for the CEG, maintain quality through provision of ice, and assist in marketing the fish. The role of the LGU is to support a business-friendly

environment, help build local capacity to manage the fresh seafood livelihood enterprise, and advance fisheries management. The role of the premium market actors, such as restaurants and seafood dealers, is to support and purchase responsibly-sourced seafood. Rare implemented this model at two of its sites. The CEG was formed with initial members being some of the fishers of the savings club. A stock assessment was conducted to ensure that target species could support increased catch and market demand. Rare and the LGU supported training for the CEG members in terms of leadership and financial management and Good Manufacturing Practices and Fishery Practices Improvement with the purpose of ensuring that the CEG could reach and sustain market standards and protocols. A buyer, which conducts business in fresh seafood trading for premium markets for some high valued species was identified. Rare continued to identify potential markets of fresh seafood by exploring partnerships with other companies and interested buyers for the fresh seafood. Challenges to this model included changing climatic patterns that impacted the availability of fish supply and the need to educate consumers about the seasonality and varying availability of fish, as well as moving demand away from already vulnerable yet well-known species such as groupers and snappers to relatively more abundant yet less well-known species.

4.2.3. Market pull strategies

The project developed and tested market 'pull' strategies by organizing and preparing fishers to meet market requirements. Technical assistance was provided to six CEGs with more than 120 fisher-household members to meet market requirements and maintain high quality product standards for premium fish markets. The improved fish handling allowed for increased demand for and higher value of the fish products since they passed a higher standard for more discerning consumers. It also allowed the project a chance to test a marketing positioning based on responsibly caught fish among niche markets.

The market "pull" strategies enabled the sale of Php 500,000 (US \$10,000) worth of responsibly-sourced seafood products to local and premium markets over the period of nine months. Although these sales figures are small, they need to be measured against a zero sales baseline, since most of the pilot sites had very little or non-existent value added activities for their catch. Developing these approaches resulted in additional income for the fishers and their families that can now continue into the future. Through the project, there was an increase of around two to three times the local "dockside" price for finished products (dried fish) and around a 25% additional price increase for fresh fish sold to Conservation Enterprises. Aside from the financial returns, the confidence of the local fishers and their households to connect and deal with the market was boosted. This will go a long way as they transition to engaging in the formal market.

In addition, support was provided on collective marketing of seaweed and strengthening local government unit economic development planning.

4.2.4. Collective marketing - seaweed supplemental income model

The Philippines is one of the world's biggest supplier of cultured seaweeds. A collective marketing model was tested for community seaweed production. In Tinambac, Camarines Sur, seaweed farmers from three *barangays* (villages) wanted to establish a cooperative for the joint production, processing and marketing of premium quality seaweed products. The production of seaweed, *Eucheuma*, occurs on farms in the shallow waters around Tinambac. A business plan was prepared to establish the Tinambac Agri-Fishers Cooperative. The seaweed farmers were provided training in a new method of seaweed production which aimed to increase production and growth rate. The method had a grow-out period of 60 days, which is almost twice as long as the traditional methods being used by farmers but increases the amount of carrageenan and gel strength of the seaweed which is where the product value comes from. The method had higher running costs for the farms due to the increased grow-out period. The business plan

evaluated new markets, prices, cooperative establishment and operation costs, and finances. Links were developed with national government agencies to provide training in the establishment and operation of cooperatives. The pilot test of the collective marketing model demonstrated the effectiveness of the new method of seaweed production towards improving the quality of seaweed in the area. However, the small number of seaweed farms could not meet the volume required by the buyers to enable individual farmers to receive better prices for their seaweed. The longer grow out period was also a challenge as households required alternative sources of income for a longer period.

4.2.5. Integrating into local economic development

A toolkit to integrate coastal resource management plans into local economic development (LED) planning through the Municipal Comprehensive Development Plan (CDP) was prepared and used in a training for LGUs. The plan, of which a local economic development plan is a component, sets out the vision, goals, objectives, projects and activities relevant to five development sectors, namely, social, economic, infrastructure, environmental and institutional. Coastal LGUs are also mandated to prepare a Coastal Resource Management plan to manage coastal and fisheries resource use to sustain food production and economic benefits. Often these plans are not undertaken in a coordinated manner which reduces their benefit to local people. Many of the strategic needs of fishermen and coastal households and communities are directly linked to local economic development. The CRM plan can serve as an important component of the LED Plan by providing identification of stakeholders, information of economic activities, and prioritized strategies for fisheries and coastal resources in the LGU.

4.3. Phase 3

Phase 3 was meant to replicate and widen the base of LGUs that engage in sustainable marine and fisheries management by scaling the capacity, enterprise and market interventions, as well as innovative business models, which proved to be successful drivers of this behavior in Phase 2. To date, ten other LGUs in the Philippines are now implementing savings clubs. Toolkits developed in previous phases of the project are available and can be configured to support any plans for replication. There are a number of new opportunities for market links with some potential private sector partners interested to support sustainable fisheries programs.

5. Discussion

Fisher households are prone to various crises and shocks that puts a lot of stress on their already vulnerable condition making them less economically resilient. Given the few assets of a fisher household, their ability to cushion the negative impact of crises and shocks is limited. In most cases, stressed fishing households with limited resources often resort to more extraction of the limited asset available to them, the fishery, their natural capital. Fishers are forced by economic pressure to engage in unsustainable fishing practices in order to cope with either a short or long-term stress i.e. education of children, health emergencies, etc.) To reduce the on-going threat to their natural capital, from overfishing, the fisher households need support to capture, retain and build their assets. One of the strongest assets of the fisher household is their social network of friends, relatives and neighbors – social assets. The project built on this foundation to implement its strategy of reducing the threat of overfishing through household asset building and connecting fishers to others in the community and to better markets. The project believed that improving market incentives can increase fishers support for and compliance with fisheries management rules and contribute towards reducing the threat of overfishing.

The project activities were all built around developing more resilient fishing households. This involved first understanding the landscape and uniqueness of each site through several foundational studies

in order to gain a better understanding of the range of livelihoods, value chain, market and development support interventions that may be combined with ecosystem-based managed access fisheries as a means to secure fisher incomes, allow a scientifically determined reduction in fishing effort and build household resilience. It then looked at building household resilience through asset-building interventions (savings clubs, conservation enterprises, business models, post-harvest handling) in order to reduce risks and vulnerabilities, reduce threats to marine biodiversity (e.g. preventing relapse into illegal fishing behaviors during family emergencies), provide for great social protection, and increase income. Building household resilience involves linking household livelihood interventions to sustainable fishing behaviors.

The project built household financial assets using a “turnkey” solution (VSLA approach) of developing community savings associations (called the Fish Forever Savings Clubs) and by developing and strengthening social networks and partnerships both within and outside the community. The savings club approach enabled fisher households to have access to funds either through savings, loans, or social insurance. The financial access enabled the members to do a number of things that included increasing their human capital (keeping their kids in school and access to health services), investing in new or existing businesses, and furthering their social capital as they continued to work as a group or a community of savers. The financial assets built by the savings club members reduced their over-all indebtedness and helped them plan for further investments in better physical assets such as improved dwellings and household assets. The savings clubs not only give them access to funds, but boosted their morale and aspiration to aim for a better quality of life for their family. Savings clubs can serve as the foundation and the behavior change mechanism to get fishers and community members to use financial tools. This can eventually lead to connecting individuals and community enterprises to formal financial service providers that can provide appropriate services to communities.

However, not all sites and savings clubs were the same. The major difference was in the speed in which the sites adopted the approach. The municipalities of Looc and Lubang, for example, had the highest number of savings clubs formed, primarily due to the push by local partners and the absence of a banking facility. In Cortes, the Mayor mandated that all barangays should have a savings club. In other sites, local government officials were wary that making people engage in financial intermediation may have negative consequences on social cohesion and have a political backlash. However, due to success of the activities in other municipalities, the sites who lagged behind started to support the activities. The Municipality of Ayungon, for example, is expanding its coverage to other coastal and upland areas.

The project did not include a formal evaluation component to quantitatively measure changes in household resilience as a result of project activities. However, the data available on the project impacts does allow inferences to be made about changes in household resilience. A total of 102 savings clubs were formed with total membership of 1693 females (76%) and 544 males (24%) across all sites. Almost 70% of these savings club members have availed of loans for various purposes and 28% of those have borrowed money from the savings group two to three times. Before the savings clubs, the households would need to borrow money, if possible, from local moneylenders, businessmen or fish traders. As a result of the savings clubs, the households now have improved credit access with better loan repayment terms and lower interest rates. The breaking of the cycle of borrowing and repayment of money from different sources has allowed households to save rather than be constantly in debt. The savings club members report that access to credit has allowed them to think about the future rather than just for the day. This access to credit has increased overall household resilience through improvements in human, social and financial capital. Factors that make households more resilient to shocks and stresses include income and access to food; improved assets such as housing, fishing gear and fanning equipment; social safety nets such social funds; and improvements in households'

adaptive capacity which is linked to education, health and diversity of income sources [20]. Fifty-four percent (54%) of the savings club members across all sites report that the access to credit allows the household to better deal with fluctuations in fishing income and stabilize payment of household expenses such as food, bill payment and house repair. The savings club members across all sites also reported that credit access has aided them in being able to send their children to school and improve family health care. Forty-two percent (42%) of the savings club members who obtained loans from their respective savings group reported that the primary purpose of the loan was to fund the educational needs of their children. Ten percent (10%) of savings club members across all sites reported that the loan was used for medical related expenses such as hospitalization and purchase of medicine for ailing family members. Savings club members get access to the group's social fund that can also help address medical expenses. Almost 20% of savings club members from Cantilan revealed that borrowed money from the savings group is used for debt repayment. Over twenty percent (20%) of the savings club members across all sites reported that their loan was used as starting capital for a supplemental livelihood (such as farm equipment or small *sari sari* (grocery) store) or additional investment to their existing livelihood enterprise (such as fixing fish nets or purchase of new fishing gear). In Looc, for example, it was reported that 20% of the borrowers, with an average loan amount of P8938 (US \$169), used the amount for these purposes. Lubang had the highest percentage (38%) of savings club members who reported that the borrowed money was used for additional capital to support their existing livelihood enterprise.

The savings clubs made it possible for fisher households to invest in productive businesses since they had the financial resources. This facilitated the formation of Conservation Enterprises that enabled members to participate in responsible seafood business. The Conservation Enterprises became the bridge between profit and conservation by leveraging market incentives. Members of the Conservation Enterprises put their own equity in the business, building a strong foundation of ownership and buy-in into the strategy, addressing a critical lack identified by research of past livelihood projects. Eventually, the Conservation Enterprises will enable the fishing households to be integrated into the formal economy, where they can benefit from enforceable contracts and more transparent transactions. Transitioning to the formal economy can provide a pathway for fishers and their households to gain access to more support services, especially business development and financial products necessary to sustain a business.

For the Conservation Enterprises, the municipalities of Looc and Lubang were able to sell more products compared to the other sites because they have prior experience in the business and have an existing client base. Also, they are closer to the premium market of Manila and the costs of shipping their products are lower compared to other sites, a major obstacle for these other sites. The availability of fish was also a challenge for all of the sites. Since Fish Forever is a sustainable fisheries program, fish cannot be sold if they do not meet the sustainability standards around minimum size and species type. The project deliberately decided that it would not contribute to increase any fishing pressure for already vulnerable species such as groupers and snappers. Increase in fishing pressure may be a consequence of connecting products to premium markets.

One of the most difficult challenges for the project was that many of the municipal fishing areas were already overfished. Fishers catch almost anything that they can get their hands on. Balancing conservation, market demand, and the economic needs of fishers is a tight rope that the project tried to carefully navigate. The overfishing was the reason why the municipalities of Bindoy, Ayungon, and Cortes supplied very limited fish to the new markets. One of the sites (Cortes) has designated rabbit fish as a food security species and even if there is a high demand for dried rabbit fish in the premium market, the project did not source this species from the municipality. The project turned its attention to species that were not overfished, such as flying fish, to connect them to

the new markets. This shift will help the local fisheries reduce fishing pressure on overfished species, while at the same time helping the fishers see results from adopting improved fisheries management practices.

One of the challenges in local fisheries development is the low investment in social preparation and institution building. The social capital built through the savings clubs can be leveraged to implement more collective social or economic actions. With a stronger social network, the local fishers can increase their leverage and power in the value chain by consolidating small catch or inputs to reduce costs. They can likewise be mobilized for social action such as health and nutrition improvement, natural resource remediation, and general community development work.

The Conservation Enterprise strategy is anchored on a market-driven approach that is largely lacking in many coastal livelihood programs. A market-driven approach is likewise useful for short-term projects since it can reduce the *time-to-market* of the fisher products and quickly show to the target groups that compliance with the fishery rules can be rewarded by the market. By partnering with existing market players (private companies, NGOs, and social enterprises), the project did not have to invest in market development and instead focused on building fisher household knowledge and skills (through the conservation enterprises) to become the best producers of quality seafood products and services. A critical element of the success of the pilot support to Conservation Enterprises was the provision of business development services. Provision of technical training on postharvest processing, bookkeeping services, and provision of business assets helped the Conservation Enterprises to quickly meet market requirements or formalize their business processes and systems. Continuous access to appropriate business development services will be key to their sustainability. The Philippines has a chronic shortage of business development services, especially for low income communities, because of the cost and difficulty of matching talent and skills to the needs of the sector.

Partnering with mission-aligned private companies enabled the project to capture a niche market that offered premium prices for responsibly-sourced products. The focus on niche markets is important since it did not require large volumes of product. A bigger market at this stage of fisheries recovery would simply increase fishing pressure on already vulnerable fisheries. Furthermore, the work with mission-aligned companies enabled the project to test the market for less popular but also less exploited species, such as flying fish. With the increasing awareness of the market for the project's approach, there was an increasing number of private sector partners willing to support sustainable fisheries. In the future, there is an opportunity to connect fish products to existing models such as community supported agriculture (CSA) and their subscribers. Connecting with a CSA model will enable Conservation Enterprises to reach a market supportive of sustainability standards and willing to pay a premium. However, there is a need to strengthen consumer education to increase the target consumer's knowledge about sustainable fisheries.

A similar approach was applied to all business models tested in the project. The dried fish trading through a social franchising model gained more traction given that it did not require a large investment in both infrastructure and human capital building. Fish drying also helped the communities manage the "supply glut" of target species such as flying fish and squid during peak seasons. The fresh seafood sourcing model was briefly tested but the challenges around fish supply (impacted by changing climatic pattern and low fish supply), as well as poor cold chain infrastructure, reduced the window for more market testing activities.

One of the critical insights from this project was the challenge around a more systems perspective among local implementers, including fisheries and business managers. The attempt to integrate the project initiatives and approaches into the local economic development planning was done in order to support their sustainability, because in

most municipalities, economic and ecological sectors are always treated separately, despite the obvious inter-connection. This situation is not a function of low priority or lack of recognition of the connection, but of the difficulty in managing the complexity of a systems approach. Without efforts to synch markets and ecology, creating a balance and sustainability will always be hindered. For instance, there are a number of market policies that have positive or negative impacts to sustainable ecology which are often overlooked, such as how revenue collection and taxation could either incentivize or penalize unsustainable fishing practices. Ultimately, local economic policies can reinforce sustainable fishing practices if integrated into the conversations of both the economic and fisheries managers.

Several opportunities were exploited in the project. One was an improved understanding the market for seafood in the Philippines and the growing demand for responsibly-caught, high quality seafood. The other was a network of partners who provided a range of resources and skills to support project initiatives. This included the fishing community, national government agencies, the local government unit, non-governmental organizations, academe, and private companies.

Among the challenges faced by the fishery enterprises was the seasonality of fish at the sites and the unavailability of certain species due to overexploitation, which limited their ability to access markets. This highlighted the importance of undertaking a fish stock assessment of the area before developing new markets or expanding existing demand. It also highlighted the need to have a larger network of sites in order to source a steady supply of fish for the markets. Additional investments in building local capacity to manage a market-oriented approach is still critical. Local fishers are still very accustomed to more supply side interventions, which impedes their ability to align their fishing and post-handling activities with market specifications and standards. This is aside from the need to manage conflicting interests among local actors and “power holders” to make sure that the market intervention will benefit the fishers, and not further entrench the local elite and sustain the status quo.

6. Conclusions

Through the project, it was possible to move toward building both fisher household financial resilience and support for activities that can sustain fisheries. A foundational conclusion of the project is the importance of linking household livelihood interventions to sustainable fishing behaviors. The savings clubs expand the planning horizon for fishers; from short term (day-to-day survival) to longer term financial planning by saving for the future. The Conservation Enterprise approach facilitates a mutually beneficial relationship between biodiversity conservation and livelihoods. Fishers receive a premium price from the market (through the Conservation Enterprises) if they comply with sustainable fishing practices identified by both fishers and fishery managers as key to managing marine resources and enabling recovery. This included supportive behaviors such as being registered; fishing in the right place at the right time with the right gear and catching the right fish; participating in meetings; and reporting catch.

Transitioning to more sustainable near-shore fisheries has the potential to support the livelihoods and well-being of fishing communities dependent on the health of their fisheries and to stabilize and eventually increase protein supply for poor and vulnerable communities. The project supported this transition by increasing the value of the fishers' catch through improved handling practices, by connecting them to better markets and, by providing economic incentives through higher prices for responsibly-caught fish. Access to formal financial services (rather than dependence on fish traders or moneylenders), and improved fishing practices and behaviors to support conservation of target

species can also affect long-term well-being of fisher households. These create a mutually reinforcing relationship that will strengthen local fishers' support for biodiversity conservation, leading to more sustainable fisheries.

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