



The Conservation Agreement as an Ecosystem-based Adaptation Strategy to Address Climate Change in Silonay, Calapan, Oriental Mindoro, Philippines

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Abstract

Climate change has been affecting the lives of people in coastal communities. As a response, the search for strategies that will address its impacts has urged for more attention. Ecosystem-based adaptation, an emerging adaptation opportunity, presents a viable option through the conservation agreement. The study aims to explore conservation agreement as an ecosystem-based adaptation strategy addressing climate change in Silonay, Calapan, Oriental Mindoro, Philippines. Specifically, it seeks to: (1) discuss the conceptual model of the conservation agreement as an adaptation strategy in Silonay, and (2) expound on its application through the stages of the conservation agreement in Silonay. The study utilized qualitative assessment of the gathered information from key informant interviews, focus group discussion and secondary data collection. Results have shown that conservation agreement in Silonay was patterned from the conceptual model of conservation agreement of Conservation International. It emphasized on two specific actions that would promote coastal protection and adaptation such as mangrove rehabilitation and income diversification. The type of conservation actions served as the key factor differentiating the conservation agreements from each other. The interventions differs because conservation agreement depends on the specific climate impacts of the site where it has to be implemented. For the intervention to work, the benefits from it should be greater than the forgone potential gain of the people from using the resources. Consequently, the stages of conservation agreement in Silonay followed the nine-step procedure on a conservation agreement by Conservation International.

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Improving the adaptive capacity of Silonay to climate change has taken extensive human and financial capital as found out in the preparatory and implementation phase of the conservation agreement. While the conservation actions of mangrove rehabilitation and livelihood diversification were completed, sustaining the project posed great challenges especially for the livelihood component. It was concluded that conservation agreement is a site specific, incentive-based, binding contract used as an adaptation strategy towards climate change. Sustainable community enterprises adhering to the principles of local economic development should be strengthened in the conduct of a conservation agreement.

Keywords: conservation agreement; ecosystem-based adaptation; climate change.

1. Introduction

The Philippines is known for having one of the longest coastlines in the world. It is estimated that about 60 percent of its populace reside in coastal areas [1]. With its abundant marine resources ranging from coral reefs, fisheries to mangrove and coastal forests, coastal communities depend on these resources for economic benefits and ecosystem services.

However, coastal communities are up to face complex challenges posed by the anthropogenically induced climate change [2]. Climate change has its impacts seen in the variations on growth of mangrove forests, patterns of fish cycles and even changes on the socio-economic life of local communities [3]. Specific climate impacts for coastal areas include submergence, coastal erosion and coastal flooding due to sea level rise [4]. The need to address the impacts of climate change is especially felt and urged by people residing in coastal areas [3].

Ecosystem-based Adaptation (EbA) is considered to be an emerging adaptation opportunity in response to climate change. The Ecosystem-based Adaptation refers to the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people respond to the adverse effects of climate change [5].

The study focused on the conservation agreement of the Silonay Mangrove Conservation and Ecotourism Project in Calapan, Oriental Mindoro, Philippines. The conservation agreement served as the platform through which the ecosystem based adaptation was implemented in the locality. The project aims to enhance coastal protection and strengthen fisheries resilience as well as to improve the resilience of local livelihoods and build the resilience of local fisheries to degradation of coastal habitats [6]. The Silonay Mangrove Conservation and Ecotourism Project, also known as Silonay Eco-park, is the actualized form of the conservation agreement. It is situated within the Silonay Mangrove Protected Area, the biggest forest in Calapan city with an estimated area of 41 hectares [7]. This initiative, a pilot case in the country, has been made via the collaboration between Conservation International (CI), an international non-profit organization and Sama-samang Nagkakaisang Pamayanan ng Silonay (SNPS), a local people's organization in Silonay.

The study aims to explore conservation agreement as an ecosystem-based adaptation strategy addressing climate change in Silonay, Calapan, Oriental Mindoro, Philippines. Specifically, it seeks to: (1) discuss the conceptual model of the conservation agreement as an adaptation strategy in Silonay, and (2) expound on its application through the stages of the conservation agreement in Silonay.

The study explored the conservation agreement in Silonay from the key institutions viewpoint rather than individuals perspectives. Further, it only focused on the characterization of the conservation agreement in Silonay and did not include an evaluation of the mechanism.

2. Materials and Methods

The study site was at the 41-hectare Mangrove Conservation and Eco-Park located in Silonay village, eastern portion of Calapan Mindoro Oriental province. Silonay (refer to figure 1) is a component village of the city of Calapan in the province of Oriental Mindoro in MIMAROPA region of the Philippines. Silonay is classified as a disaster-prone area with high vulnerability to typhoons and floods [8]. Silonay was noticeably vulnerable to two environmental stressors namely (i) sea level rise and (ii) changes in pattern of wet and dry seasons. Other significant environmental threats included storm surge, salt water inundation, and coastal/ beach erosion and climate-related land or mud slide [9]. The geographic position of Silonay, specifically the areas of residency and resource use, made it susceptible to the different climate events and impacts. Silonay has high dependency on their natural resources which determines its sensitivity towards climate change. The study utilized (1) focus group discussion, (2) key informant interviews, (3) and gathering of secondary data. The information gathered were analyzed mainly through qualitative assessments in the form of content analysis, site documentation and literature review.

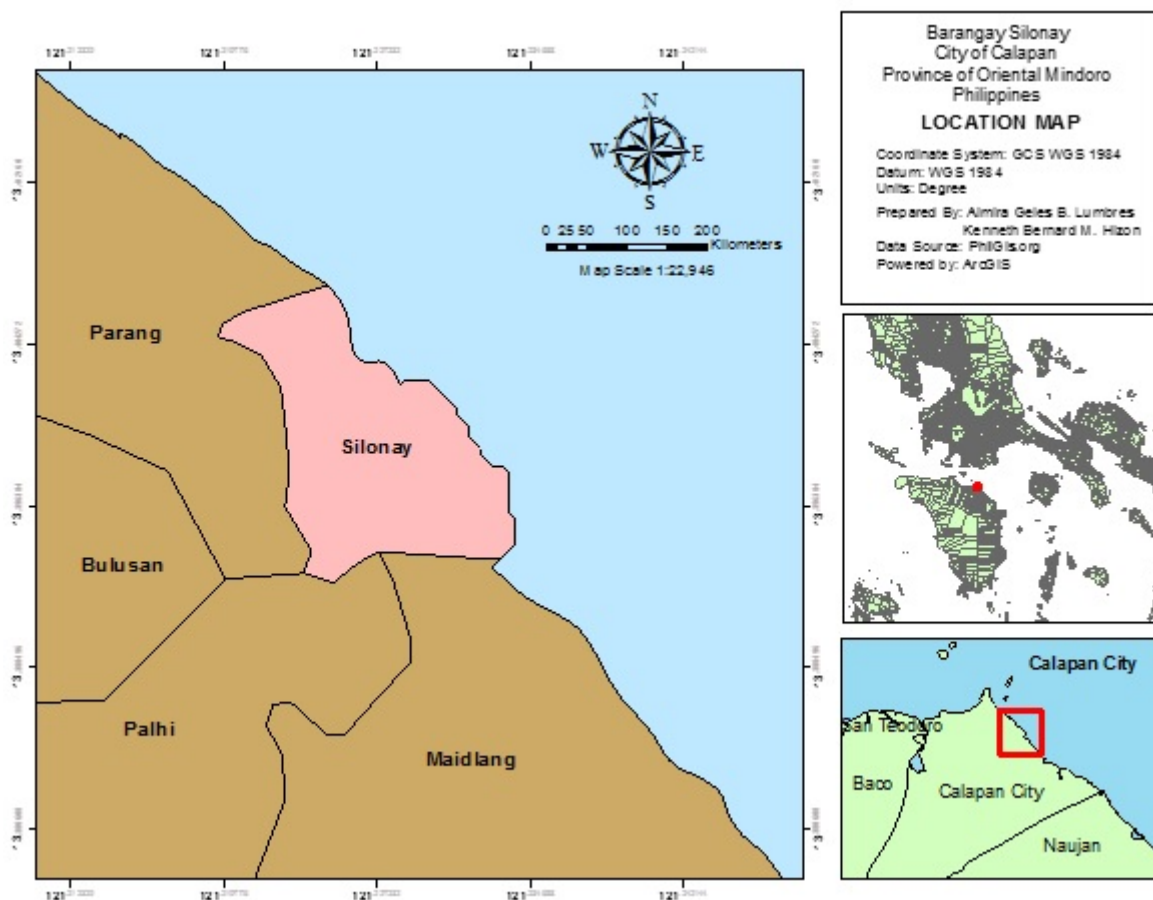


Figure 1: Location map of Silonay

3. Results and Discussion

Conservation agreement is a mechanism where national and local authorities, communities, or individual resource owners agree to protect natural ecosystems in exchange for a steady stream of structured compensation from conservationists or other investors [10]. The idea is that a conservation action must be undertaken by the resource users and in return, they will be provided with benefits for doing the action. This conservation action is designed to respond to specific threats to biodiversity in the area while the benefits are structured to offset the opportunity cost of the conservation action incurred by the resource users [10].

3.1 Conceptual Model of Conservation Agreement

The conservation agreement model has been used by Conservation International (CI) in their Conservation Stewardship Program which offers direct incentives for conservation through a negotiated benefit package in return for conservation actions by communities [11]. Conservation agreements offer direct socio-economic benefits to resource users in exchange for commitments to changes in resource-use practices [12]. Specific conservation actions have to be undertaken by the resource users, and benefits will be provided in return for those actions. “These conservation actions to be undertaken by the resource users are designed in response to the threat to biodiversity” [10].

On the other hand, “the benefits are structured to offset the opportunity cost of conservation incurred by the resource users. The opportunity cost of conservation reflects the value of what resource users give up by not utilizing their resources under the business-as-usual scenario. The sum of forgone income from resource use minus the sum of avoided environmental costs is the opportunity cost” [10]. Examples of incentives to compensate the trade-off are social services, employment and community development. Figure 2 shows the conceptual model of conservation agreement by Conservation International.

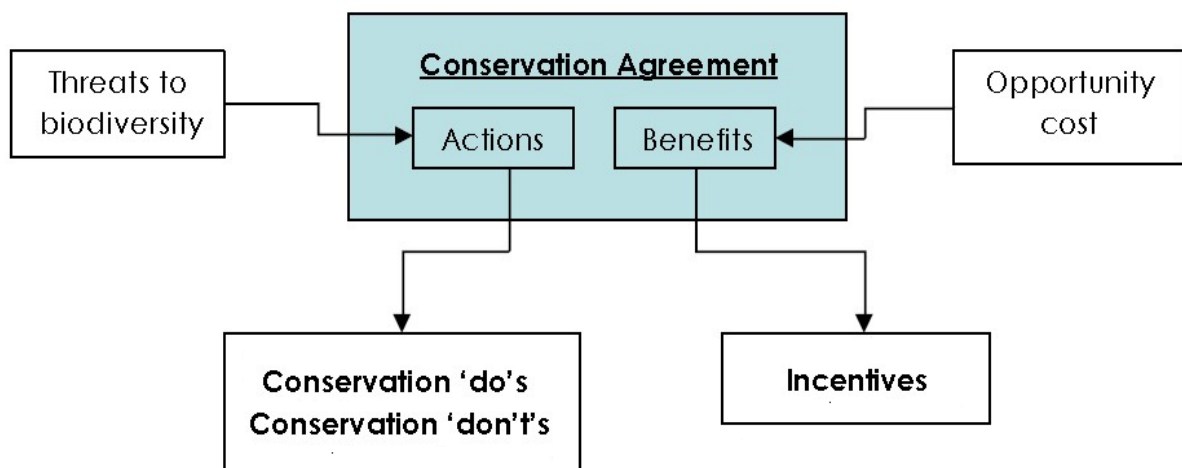


Figure 2: Conceptual model of conservation agreement (adopted from Conservation International, 2007)

The case of Silonay is a conservation agreement between Conservation International (CI), an international

environmental organization and the Sama-samang Nagkakaisang Pamayanan ng Silonay (SNPS), a local people’s organization in Silonay. The main conditions of the agreement stipulated that SNPS should implement a conservation intervention of enrichment and rehabilitation of the 25 ha mangrove forest in the mangrove protected area (MPA) along with the protection of the whole 41 hectares of the MPA, and establish at least two livelihood sources in the village. In return, CI provides the direct incentives to SNPS as their partner organization. The specific incentives given to SNPS are in the form of livelihood and capacity building. Following the conceptual model of conservation agreement by CI, the conservation agreement model in Silonay was developed as shown in Figure 3.

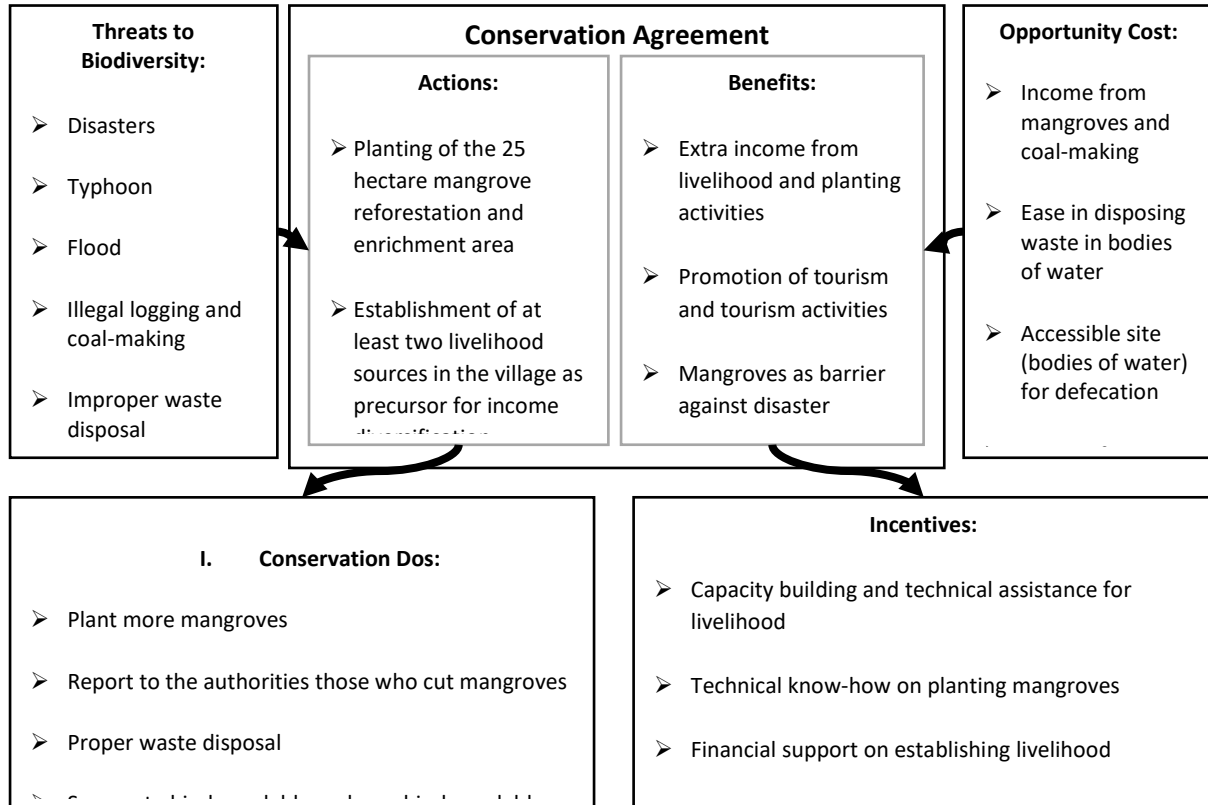


Figure 3: Conservation agreement model of the Silonay Mangrove Conservation and Ecotourism Project¹

The conservation agreement in Silonay emphasized on two specific actions of rehabilitating the 25 ha mangrove protection area and establishing at least two livelihood projects that would promote coastal protection and adaptation. These actions are in response to the threats posed by the exposure of Silonay to climate change impacts such as frequent storm surges, typhoons and floods which were worsened by the destructive human activities on the natural environment. The mangrove rehabilitation was geared on providing coastal protection for the people of Silonay by serving as a natural barrier against typhoons. The livelihood component was put in place to increase the adaptive capacity of the residents by providing them with supplemental livelihood to augment their daily expenses. Various income generating activities were formulated for conservation agreement

¹The Silonay CA Model was derived mainly from the outputs of focus group discussion among the members of SNPS and the community supplemented by informant interviews and reviews of SNPS reports and consulting agreement.

in Silonay which include the SNPS store, the entrance fee system for the Silonay eco-park, and the souvenir items among others.

However, by doing the conservation actions, certain opportunities were lost in the process. Residents were not allowed to harvest crabs, park boats in the mangroves and cut mangrove trees. To offset the forgone opportunities, the conservation agreement presented benefits from doing the conservation actions. Aside from abstract benefit of coastal protection, concrete monetary benefits were also availed by both SNPS and local community members. Community members received income from mangrove planting and engaging in the tourism activities of the eco-park. SNPS got their benefits from the dividends members annually receive from organization, and also as payment for planting mangroves. For the intervention to work, the benefits from it should be greater than the forgone potential gain of the people from using the resources. This was made possible through providing incentives in the form of social capacitation, technical assistance, and financial support for livelihood project and the technical know-how on planting mangroves. Social capacitation was considered as another adaptive strategy which allowed the people to understand the concepts on conservation and climate change.

Models of conservation agreement differ largely on their nature (what it is), motivations (why it is) and execution (how it is). The type of conservation actions served as the key factor differentiating the conservation agreements from each other. The intervention differs because conservation agreement depends on the specific climate impacts of the site where it has to be implemented. "The flexibility of conservation agreements allows them to be adapted to a wide variety of settings, situations and needs where other mechanisms cannot be applied. Conservation agreements can be tailored to many different circumstances with respect to ecological settings, legal systems, social and cultural contexts, and economic drivers of threats to natural habitat" [10]. Conservation agreements deliver concrete, measurable benefits for human well-being whereby the opportunity cost in doing conservation is well accounted for [11].

The conservation agreement utilized both economic and non-economic instruments. Planting more mangrove trees would increase the vegetation in the area which would lessen the impacts of disasters and climate change in the locality.

On the other hand, putting in livelihood component would incentivize the residents and prevent them from doing actions that would destroy the environment. If the threats to biodiversity are reduced by transforming the livelihood and practices of the people so they become environmental friendly rather than being threats, then the cost to protection is being reduced at the same time. In doing so, the conservation interventions promote both maximizing benefits and reducing costs of protection in the village.

3.2 Stages of Conservation Agreement

The stages of conservation agreement showed the actual implementation of the conceptual model of the conservation agreement in Silonay. As per Conservation International in 2007, a series of steps has to be undertaken when introducing a conservation agreement. The main steps are summarized in box 1.

Box 1. Steps in Conservation Agreement

1. Choose sites based on a rapid feasibility analysis conducted prior to agreement design.
2. Begin engagement by building a relationship with interested resource owners/managers in a transparent and participatory manner.
3. Build on this relationship to design and formalize an agreement that is:
 - a) win-win (benefits both biodiversity and the resource owner/manager), and
 - b) quid-pro-quo (the provision of benefits is conditional on conservation performance).
4. Before implementation, build socio-economic and biodiversity baselines and define a monitoring system for both.
5. During the implementation phase, meet commitments punctually and facilitate the resource owners/managers in meeting theirs.
6. Consider an initial short-term *trial* agreement to allow both parties to evaluate and refine agreement for the long term.
7. If a long-term agreement is sought, work together to *sell* the agreement to potential funders.
8. Throughout the implementation of the agreement, apply biological and socioeconomic monitoring systems.
9. Throughout the process, contribute to improving the model by participating in a global learning network of implementers.

Source: Conservation International, 2007

Yet, to better understand the stages of a conservation agreement, the experience of Silonay on its conservation agreement was broken down into three phases: the preparatory phase, implementation phase and post agreement phase.

3.2.1 Preparatory Phase

The preparatory phase provided the ground works prior to the take-off of the agreement. It started with the conduct of vulnerability assessments for the Verde Island Passage, followed by the village level assessments including mangrove assessment, socio-economic assessment and biodiversity assessment, and the establishment of mangrove marine protected area. This phase covered the first four steps of the conservation agreement by Conservation International.

In 2009, Conservation International initiated and completed a macro level vulnerability assessment for the whole Verde Island Passage Marine Biodiversity Conservation Corridor as the target area of the Ecosystem-based Adaptation project in the Philippines. This was done to determine what ecosystems in Verde Island Passage (VIP) are vulnerable to climate change and where these areas are located. The vulnerability assessment served as a baseline for Conservation International to pinpoint which towns and cities are vulnerable to climate events particularly to typhoons and storm surges. Given its socio-ecological condition, Silonay village in Calapan city was selected by CI as potential project site among other villages, cities, and towns in the VIP. The provincial government facilitated the entrance of CI by linking them directly to the city government, village government and SNPS.

After the initial site selection, village level assessments were conducted by CI in Silonay in coordination with

village government unit. These assessments were part of ground validation procedure by CI to strengthen its basis for site selection. The assessments provided the information on the profile of the community, status of biodiversity, and the needed conservation interventions in the area. The assessments also ensured that a cause of environmental problem in the area is attributed to climate change induced by both anthropogenic causes and natural processes rather than pure human action. Mangrove assessment, socio-economic assessment and biodiversity assessment were conducted as preparation for the implementation of the conservation agreement.

In 2011, the Silonay Mangrove Marine Protected Area (MPA) was established from the initiatives of the village with support coming from the city and provincial government. This was alongside the assessments still being conducted at the village. The consequent passage of Silonay MPA led to the implementation of the conservation agreement between SNPS and CI. Representative from the Fisheries Management Office of the city emphasized that the MPA was actually part of the preparation for the establishment of Silonay Mangrove Conservation and Ecotourism Park.

Silonay was selected as pilot site in the Philippines since it fits the criteria set by Conservation International. These criteria include completing the vulnerability assessments, making certain that the project addresses a climate change impact particularly related to coastal protection, ensuring the willingness of the community to work with Conservation International, and making sure that the project site is safe. Only when the village was assured that it passed the selection criteria did the implementation of the conservation agreement take place.

It took a two-year extensive preparation in Silonay before the one-year conservation agreement was implemented. Major costs were incurred from the series of assessments made for ground validations and assessments. CI representative explained that at the village level alone, each assessment was valued at Php 30,000/ USD 675 which only includes the actual supplies and materials for the assessment. However, it excluded the key expenses such as payment for experts and consultant, compensation for CI staff, accommodation, food and fare which were all shouldered by CI.

The absence of baseline information and environmental accounting in Silonay contributed to the long preparatory assessment on the project site. However, the unavailability of baseline information is not isolated in Silonay as it is a typical issue among conservation areas in the Philippines. Biodiversity assessment requires information that were not usually incorporated in community surveys. Data generation remains a major constraint in conservation areas that require big investment.

3.2.2 Implementation Phase

The implementation phase largely dealt with the execution of the conservation action of rehabilitating and enhancing the 25 ha mangrove area and the establishment of livelihood/income generating projects. Monitoring of these two provisions was also made during the implementation of the conservation agreement to ensure that deliverables were accomplished within the time frame. The implementation phase encompassed steps five to eight of the stages in conservation agreement. By the year 2012, Conservation International started doing information education campaigns, and conducted meetings and consultations with the community. During that

year, aside from the social capacitation, CI had been asking the community members of livelihood trainings that the residents would want to participate in. SNPS was tapped by CI through the Strategic Intervention and Community-Focused Action towards Development (SICAD) office of the provincial government which identified SNPS as an existing people's organization in Silonay whom CI can partner with instead of creating new ones. Prior its engagement with CI, SNPS was solely intended to generate livelihood opportunities for its members. Hog-raising which previously served as the major livelihood activity of SNPS was scrapped out as it was realized to be incompatible with the environment.

On January 28, 2013, the signing of the agreement between CI and SNPS was made which officially marked the start of implementation of the conservation agreement. This works with an existing memorandum of agreement between CI, the city of Calapan, and the provincial government of Oriental Mindoro where they agreed to render mutual collaboration and cooperation in promoting biodiversity conservation and sustainable resource management.

The conservation agreement had two main provisions, namely: (1) the completion of planting of the "25 hectare mangrove reforestation and enrichment area corresponding to at least 140,000 mangrove propagules to be planted inside Silonay Mangrove MPA in one year" [13]; and (2) the establishment of at least two livelihood sources in the village as precursor for income diversification. The conservation agreement also detailed the use of Php 1 million/ USD 22,420 project fund, 60% of which was allotted for mangrove enhancement while the 40% was for income diversification [14].

On the actual implementation, payments were programmed on a deliverable basis. SNPS received the funding only when they submit deliverables as indicated on the performance schedule. CI required SNPS to do monitoring activities and regularly submit progress reports to determine the extent and survival of the mangroves planted as well as the status of the livelihood projects. The payments were released into three tranches as the outputs were delivered. "The first tranche was released upon signing of the conservation agreement amounting to Php 375,000/ USD 8,410 or 40% of the total project cost financing both livelihood and planting activities which were simultaneously conducted in the village. The second tranche or 30% of the project cost was given to SNPS on October upon submission and approval of progress report detailing the mangrove rehabilitation and enhancement activities on the project site. The third tranche meantime was given upon the completion of the last (5) hectare enrichment area by the end of the year" [13].

On the first months of project implementation, the mangrove enrichment and rehabilitation was carried out exclusively by the SNPS members. Mangrove enrichment and rehabilitation started from selling of the seedlings by some SNPS members to the SNPS organization. The seedlings were cultured from the existing community nursery owned by the village government which was eventually maintained by the project. Usually, the members who gained income from selling of the seedlings opted not to engage in the actual planting anymore. SNPS would then ask the other members to do the planting and pay these participants with 1 peso per seedling planted.

By October 2013, SNPS changed its strategy and involved the whole Silonay community since they alone

cannot meet the deliverables that had to be completed by December. From October until the project was completed, planting was done three times a week. On the average, each person earned Php 200-300/ USD 5-7 per planting day with a modal one to two working days per person. The breakdown of the mangroves planted were shown in the table 1.

Table 1: Mangrove planting activity per area covered and date planted

Mangrove propagules planted	Estimated area covered (ha)	Date planted
		(2013)
28,693	2.8 ha	February-July
13,809	2.8 ha	August-September
2,600	0.5 ha	October 8
5,370	1 ha	October 14
7,500	1.5 ha	October 16
4,700	0.9 ha	October 17
9,586	1.9 ha	October 19
11,699	2.3 ha	October 21
12,700	2.5 ha	October 22
16,760	3.4 ha	October 26
8,000	1.6 ha	November 16
2,000	0.4 ha	November 23
5,600	1.1 ha	November 24
7,500	1.5 ha	December 7
6,000	1.2 ha	December 8
Total – 142,517	Total – 25.7 ha	

Source: SNPS Conservation Agreement Final Report, 2014

The maintenance and protection of the whole MPA, on the other hand, were tasked to the 16 volunteer Bantay Bakawan (mangrove rangers) in Silonay.

The Bantay Bakawan reported directly to SNPS as they are also members of the organization. Before they were allowed to patrol the mangroves, they attended mangrove protection trainings assisted by the CI which were held and conducted at the city level.

Meantime, the income diversification component of the agreement commenced simultaneously with the mangrove rehabilitation.

CI provided a livelihood consultant who did the preliminary identification of livelihood.

Among the first livelihood projects were banana chips and cornick repacking, shingaling making, and fish and meat processing. However, the first project of banana chips and cornick repacking was stopped immediately when they realized that the operation was very expensive as inputs were sourced from Paoay, Ilocos Norte. Furthermore, sardines production did not materialize since the cost of the produce was higher than what is available in the market. What was retained was only tocino making being marketed only in the village level due to stiff competition on meat products outside of Silonay. Among these three, shingaling making was the most viable for the members of the organization. Later, SNPS established the cooperative store providing members with additional incentives when buying goods from the store in the form of patronage refund. Separate from the livelihood and mangrove planting, the agreement allotted Php 100,000/ USD 2,240 for the boardwalk and another Php 100,000/ USD 2,240 for the souvenir making of Silonay Youth Movement, a youth organization in Silonay.

This was under the intention of the project on making Silonay an ecotourism area as a coping mechanism to the specific climate change threats in the community.

The boardwalk was made without cutting the mangroves since it is situated within the marine protected area. While the construction of the boardwalk was on going, support from other organizations started to pour in. Specifically, the provincial government funded all the extensions for the boardwalk amounting to more than Php 1 million/ USD 22,420.

The city government also gave Php 100,000/ USD 2,240 for an extension of the eco-walk. The establishment of entrance fee system was already on the later part of the project (December) wherein the livelihood consultant helped in formulating the boardwalk packages. Boardwalk packages and the breakdown of allotment for the boardwalk regular package were shown on Tables 2 and 3.

Table 2: Boardwalk packages in Silonay Eco-park

Boardwalk Packages	Cost	
	In Php	In USD
Regular	50.00	1.12
Student	20.00	0.45
Senior	40.00	0.90
Silonay resident	10.00	0.22
LGU officials	5.00	0.11
LGU visitors:		
Official business	5.00	0.11
Personal	50.00	1.12

Table 3: Breakdown of allotment for the boardwalk regular package

Regular Boardwalk Package Appropriation	Cost	
	In Php	In USD
Mangrove Seedling	4.00	0.09
Boardwalk Guard	2.00	0.04
Tour Guide Fee	10.00	0.22
Reinvestment	5.00	0.11
Environmental Fee	5.00	0.11
Maintenance Fee	5.00	0.11
SNPS Profit	19.00	0.43
Total	50.00	1.12

Source: SNPS Conservation Agreement Final Report, 2014

The idea of tour packages was also introduced in Silonay wherein the Eco-park was planned to be included in hotel showcases. CI helped in creating linkages with other agencies like provincial government tourism office who assisted in creating brochures and leaflets to promote the Eco-park. Other than that, this tour package was still being developed and has yet to be translated to income.

One unintended income source of the agreement came out from kayaking. The first two kayaks, which were given by CI, were supposed to be used for monitoring and patrolling but SNPS thought that it can be a good source of income. Kayaking generates income to even pay for the paddle boat that was bought as addition for the activities in the Eco-park.

Based from these results, it was surmised that the failure of some of the livelihood projects were due to two main reasons: (1) the mismatch on the locally available resources and products being marketed, and (2) the absence of marketing strategy that will align the products to the conservation efforts. For example, the inputs for banana chips and cornick were outsourced from Paoay, Ilocos Norte and were not locally grown in Silonay. The products from fish and meat processing were not market competitive and inaccessible to its targeted buyers. In both cases, the cost of production had become greater than the possible gains making them unsuitable livelihood options. This is against the local economic development principle which emphasized on investing on local values and capitalizing on added value of local resources

Conversely, eco-tourism related income generating activities like kayaking, boardwalk, SNPS store, mangrove planting activity were sustained by SNPS. The compatibility of these livelihood options to the idea of conservation was essential for its continuity.

3.2.3 Post Agreement Phase

The post agreement phase commenced upon the completion of the deliverables on the agreement. Highlights of

this phase include the extension of the project to add 10 more hectares for mangrove rehabilitation and enhancement, the recognition of the eco-park and its people, and the upsurge of financial and institutional support from other organizations. This phase included the final step of the stages in conservation agreement.

On the first quarter of 2014, the conservation agreement was already on its final phase. This marked the end of the consulting agreement contract between CI and SNPS since all expected outputs were already delivered. However, an extension was made to include 10 more hectares of mangroves to be planted over the 25 ha stated in the agreement. The planting for the additional 10 hectares was from June of 2014 to January of 2015. The 10 hectares were the only remaining areas for mangrove planting in Silonay as identified during the early assessments of the project.

At that time, Silonay had been gaining popularity as it started to receive awards and recognition. In Oriental Mindoro, Calapan city won the Best Bantay Dagat/Bantay Bakawan and Best Managed MPA awards. Ms. Alma Bool, SNPS treasurer, won as Grassroots Women Leaders of the Coral Triangle Initiative for serving as a key person on the success of Silonay Eco-park project.

As the project gained wider recognition, other support came pouring in. One of which is the additional financing provided by Australian Aid (Php 275,000/ USD 6,170) and the provincial government (Php 90,000/ USD 2,020) to fund the mounting of the watch tower. Another was the assistance by Sagip Kapamilya, an NGO, which provided free livelihood trainings for selected SNPS members and additional kayaks for the Eco-park.

Several planting activities were also conducted in Silonay by students and other organizations. Here, SNPS got additional income from selling the seedlings to the participants which were eventually distributed to SNPS members at the end of the accounting year. In 2015, all the areas were already filled with mangroves. The partnership between SNPS and CI had extended beyond the one year term stipulated in the agreement. CI had continuously visited Silonay even after project termination. However, monitoring of Silonay after the project has ended became a challenge for CI due to limited funding. SNPS, though a strong organization, was seen to still need guidance from CI especially in ensuring the sustainability of the project. Improving the adaptive capacity of Silonay to climate change has taken extensive human and financial capital as found out in the preparatory and implementation phase of the conservation agreement. During its preparatory phase, CI invested in baseline information, social capacitation and mobilization in the community. Conservation International explained that the initial assessments and social capacitation entailed high transactional costs but were deemed necessary to make people understand the concepts of conservation and climate change. Essential to the implementation of the conservation agreement is the compatibility of the livelihood component with the conservation efforts. The unsuitability of products to the local resources and local market, and the absence of a marketing strategy linking it to the conservation effort served as main reasons for some livelihood projects to fail. The remaining income generating ventures sustained by the management of Silonay eco-park were generally eco-tourism-related enterprises. The termination of the contract did not mean the end for the conservation agreement. Continuous collaboration of actors were observed even after the project termination. However, unlike during the project implementation, difficulty in site visitation and monitoring from CI was mentioned since the project funding was already exhausted.

4. Conclusion and Recommendations

Conservation agreement is a site specific, incentive-based, binding contract used as an adaptation strategy towards climate change. Conceptually, the conservation agreement in Silonay followed the definition of conservation international (2007) where resource managers agree to protect natural ecosystems in exchange for a steady stream of structured compensation from conservationists or other investors. The stages of conservation agreement in Silonay meantime showed how the concept was applied in to actual implementation. Improving the adaptive capacity of Silonay to climate change has taken extensive human and financial capital as found out in the preparatory and implementation phase of the conservation agreement. While the conservation actions of mangrove rehabilitation and livelihood diversification were completed, sustaining the project posed great challenges especially for the livelihood component. Essential to the conservation agreement is the compatibility of the livelihood component with the conservation efforts.

With the opportunities offered by conservation agreement, the following recommendations are derived from the study:

- Climate change provides opportunity in conservation arena in the sense that many international organizations have recently become open to financing projects for climate change.
- Conservation agreement can be adopted in other areas in need of protection. However, the provisions have to be specific and flexible to the needs of the locality.
- Appropriation of funds for regular environmental scanning and ecosystem valuation for all key biodiversity areas is deemed necessary. When in place, it can fasten the process of implementation of conservation projects, it can check the priority areas in need of conservation interventions and it can lower the overhead/ preparatory costs of any conservation interventions. This can be sourced out from survival funds (CCA/DRR), or from corporate social responsibility projects in the locality.
- Sustainable community enterprises adhering to the principles of local economic development should be strengthened in the implementation of a conservation agreement. The use of local resources and local values should be emphasized in pursuit for local economic development.

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References

- [1] The Worldbank Group, "Philippines Environment Monitor on Coastal and Marine Resource Management," The Worldbank Group, Washington DC USA; Pasig City, Philippines, 2005.
- [2] T. Smith, "Climate Change Impacts on Coastal Communities: Coast Adapt Impact Sheet 13," National Climate Change Adaptation Research Facility, Gold Coast, Australia, 2016.
- [3] H. Nanlohy, A. N. Bambang, Ambariyanto and S. Hutabarat, "Coastal Communities Knowledge Level on

- Climate Change As A Consideration in Mangrove Ecosystems Management in the Kotania Bay, West Seram Regency," *Procedia Environmental Science*, vol. 23, pp. 157-163, 2015.
- [4] P. Wong, I. Losada, J. Gattuso, J. Hinkel, A. Khattabi, K. McInnes, Y. Saito and A. Sallenger, "Coastal systems and low-lying areas. In Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of Intergovernmental Panel on Climate Change.," Cambridge University Press, Cambridge United Kingdom; New York NY USA, 2014.
- [5] Conservation International, "Nature's gift, Nature's tool," Conservation International Philippines, Quezon City, Philippines, 2009.
- [6] Conservation International and Sama-samang Nagkakaisang Pamayanan ng Silonay, "Consulting Agreement," Conservation International; Sama-samang Nagkakaisang Pamayanan ng Silonay, Calapan City, Or. Mindoro, 2013.
- [7] Sama-samang Nagkakaisang Pamayanan ng Silonay, "Project Profile," Calapan City, Or. Mindoro, 2013.
- [8] Local Government of Silonay, "Silonay Six Year Barangay Development Plan 2013-2018," Barangay Silonay LGU, Calapan City, 2013.
- [9] Technical Working Group for Calapan City MPAs, "MPA Management Plan," Calapan City Government, Calapan City, Or. Mindoro, 2015.
- [10] Conservation International, "Conservation Agreements: Model, Design and Implementation," Conservation Stewards Program and Conservation Economics Program, 2007.
- [11] Conservation International, "Conservation Stewards Program," 2014. [Online]. Available: <http://www.conservation.org/projects/Pages/conservation-stewards-program.aspx>.
- [12] E. Niessen, P. Zurita and S. Banks, "Conservation agreements as a tool to generate direct incentives for biodiversity conservation," *Biodiversity*, vol. 11, pp. 1-2; 5-8, 2010.
- [13] Sama-samang Nagkakaisang Pamayanan ng Silonay, "Progress Report: Brgy. Silonay," Calapan City, Or. Mindoro, 2014.
- [14] Sama-samang Nagkakaisang Pamayanan ng Silonay, "Kasunduan sa Pagitan ng Sama-samang Nagkakaisang Pamayanan ng Silonay at Silonay Youth Movement para sa Eco-system Based Adaptation Project na Mangrove Reforestation/Rehabilitation at Income Diversification sa Barangay Silonay," Calapan City, Or. Mindoro, 2013.

Note: Exchange rate used was Php 44.60 = USD 1.00 January 2015 as per Bangko Sentral ng Pilipinas Official Website. Retrieved at <https://www.bsp.gov.ph>