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RESEARCH ARTICLE

Impact of Ecotourism on Local Community's Participation in Coastal Resource Management: Case of Palaui Island Protected Landscape and Seascape (PIPLS) in Northern Luzon, Philippines

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ABSTRACT

The establishment of marine protected areas (MPAs) managed by the community has been a popular tool for coastal and resource management in the Philippines. As the MPAs limit the use of the resources, the eco-biological components of the marine environment have been preserved and maintained, which opened opportunities for ecotourism activities. Thus, ecotourism has been developed as one way of gaining economic benefits from the coastal and marine resources while conserving biodiversity and restoring critical habitats by shifting resource exploitation from an extractive to a non-extractive usage. This study was conducted using household surveys and key informant interviews to investigate whether ecotourism's development affects the local community's participation and support on MPA management using the case of Palaui Island Protected Landscape and Seascape (PIPLS) in northern Luzon, Philippines. The respondents recognized the impacts of ecotourism on their family welfare, fishing activities, and involvement in MPA management. In particular, ecotourism development strengthens local communities' support for coastal resource management, especially if it provides enough sources of income. The results of this study could provide information to resource managers and policymakers on crafting sustainable ecotourism and alternative livelihood policies in MPAs, taking into account its possible impacts on the coastal fishing communities.

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1. INTRODUCTION

The coastal and marine ecosystems offer a diverse and dynamic part in supporting a country's economic welfare and social prosperity. They sustain the livelihoods of millions of unfortunate households, are responsible for multiple ecosystem services necessary for life, yield immense quantities of food, and play a critical role in driving weather and climate (Evans 2008). However, these resources have been exploited as anyone can openly access them. Therefore, it is vital to sustainably manage coastal and marine resources, considering these habitats' ecological importance and economic benefits. One of the most significant approaches in managing the resources is the establishment of marine protected areas (MPAs).

An MPA focuses on protecting an area of the marine environment by limiting or eliminating human activity (Pomeroy et al. 2007). It has been established as an essential tool for fisheries management, biodiversity conservation, and habitat restoration (Christie and White 2007). In recent times, MPA objectives have expanded to include social and economic concerns, specifically tourism development (White et al. 2002). The preservation and maintenance of the eco-biological components of the marine environment have attracted ecotourism activities in the areas. Ecotourism has been encouraged worldwide as a feasible and desirable way to shift the attention of resource exploitation from an extractive to a non-extractive usage.

In the Philippines, several MPAs have been developed as ecotourism sites generating a substantial

amount of revenue. For instance, the Apo Island Protected Landscape and Seascape in Negros Oriental reported to have generated total revenue of PHP 21,693,274 as of December 2008 (DENR 2009) and continuously generating funds up to the present. In addition, ecotourism activities in other MPAs such as Gilutongan Channel Marine Reserve in Cebu (Biña-de Guzman 2010), Tubbataha Reefs National Marine Park in Puerto Princesa (Tongson and Dygico 2004), and MPA Network of Batangas (Rawlins 2009), among others, provide potential income from the user's fee to support coastal regulations and development.

While it can be noted that the significant improvement in the marine habitats brought by well-managed MPAs can open opportunities for ecotourism, little has been known on the impact of ecotourism on the local community's participation in coastal resource management (CRM). For example, Oracion et al. (2005) and Majanen (2007) revealed that the economic advantages brought by the tourism sector in an MPA in Southern Luzon, Philippines, have marginalized the fishery sector in terms of access and control of the protected areas and deduced that tourism development might put social structures at risk. Fabinyi (2008) also found tension among stakeholders in Calamianes Islands, Philippines, over different understandings about the purpose of MPAs that undermined the success of such an approach and therefore suggested defining the role and purpose of MPAs to dive tourism and fishing communities. On the other hand, Jalani (2012) noted that the tourism industry in Palawan, Philippines, has been a source of income for most households and led to the change of livelihood among local people due to higher compensation in ecotourism. Thus, the results of these past studies indicate that ecotourism can positively or negatively affect the local community's economy and quality of life. Further, Elder (2005) noted that a doable coastal resource co-management arrangement would seem to entail the presence of appropriate local individuals who are able and willing to participate and suitable organizations to mobilize that participation. Researches also showed that income from fishing or fisher's economic well-being, presence of alternative livelihood, attitude towards coastal resources, and awareness level to fishery regulations stimulate fishers' participation in coastal resource management (Aldon et al. 2010; Ballad et al. 2016).

However, it is not clear how ecotourism affects local communities' attitudes towards CRM as it can possibly change their livelihood structures. Hence, this study is set out to look whether the development of ecotourism affects the participation and support of the local community on MPA management using the case of Palaui Island Protected Landscape and Seascape (PIPLS) in northern Luzon, Philippines. The results of this study could provide information to resource managers and policymakers on crafting sustainable ecotourism and alternative livelihood policies in MPAs, taking into account its possible impacts on the coastal fishing communities and resource management.

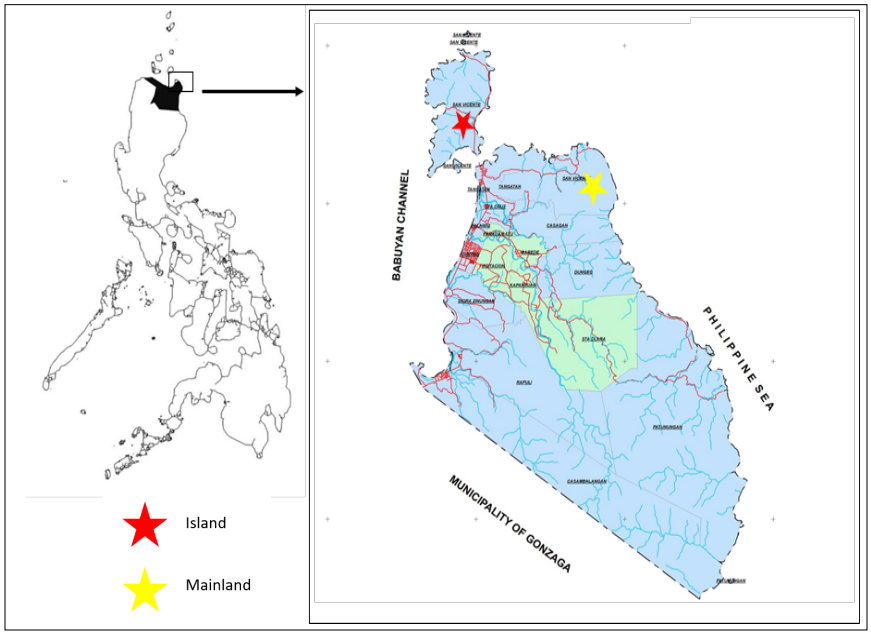

Figure 1. Map showing the location of Palau Island and the mainland municipality of Sta. Ana, Cagayan, Philippines (modified from the municipal map of Sta. Ana, Cagayan)

2. MATERIALS AND METHODS

2. 1. Study Area

The PIPLS is located in the north-eastern part of Luzon island, Philippines, in the municipality of Sta. Ana, Cagayan (Figure 1). The island is approximately 1.25 km away from the mainland of the San Vicente village and can be reached in 25 minutes by boat from the San Vicente Port. It is about 642 km away from the country's capital city of Manila. Still, despite its remote

location, PIPLS caught the attention of international and domestic tourists when it became the site of the popular US reality-based competition show (*Survivor*) in 2013, in addition to its declaration as to the 10th best beach in the same year by the Cable News Network's (CNN) choice of 100 best beaches in the world (The Manila Times 2015).

As a protected area, the island has rich biodiversity both in its flora and fauna, making it potential for recreational and exploration activities. At present, the various recreational activities in PIPLS include swimming, snorkeling, island hopping, trekking, bird watching, mangrove planting, and camping. Per visitor, an access fee of PHP 70.00 (USD 1.50 at 1 USD = PHP 46.52 average exchange rate in 2017) (BSP 2017) is collected before entering PIPLS. The Visitor Center recorded 8,500 local and international tourists in 2017 (as of August).

The local communities have developed the tourism industry in PIPLS as supported by institutions promoting environmental conservation. The local community serves the tourists with several services and activities, such as boat transportation, tour guiding, food catering, accommodation (homestay), and snorkeling, among others. PIPLS is home to 127 households, mostly dependent on fishing and tourism activities as means of livelihood. In addition, some of the 638 households (near the port) from the mainland also earn income as an effect of ecotourism activities (e.g., boat operators, souvenir vendors, hotel workers, etc.).

2.2. Selection of respondents

The individual respondents were drawn randomly from the population using a proportionate random approach. The sample size was calculated from the registered households in each purok (small zones) using the formula:

$$n = \frac{N}{(\frac{e}{Z})^2 - \frac{N-1}{P(1-P)} + 1}$$

where n = sample size; N = total household number; e = acceptable error; z = normal distribution point corresponding to the confidence level and P = ratio to the population. For this calculation, the acceptable error is set at 5%, 95% confidence level; hence z = 1.96 and expected population rate at 20%.

Two hundred thirty-four (234) and 96 respondents were randomly selected from mainland and island residents, respectively, following the calculation mentioned above.

2.3. Respondents and key informant interviews

Field observation was first carried out to identify the ecotourism activities taking place within the MPA, followed by in-depth interviews with key respondents such as village council members, officers of the people's organizations, bantay dagat (sea guards), and technical employees of the Municipal Environment and Natural Resources Office, Municipal Tourism Office, Department of Environment and Natural Resources and Cagayan Economic Zone Authority. This is to generate significant information on the establishment and current status of the MPA, village economy, and interactions within the community. In addition, examination of documents such as MPA Management Plans, tourists' information sheets, and other technical reports was also done to enhance the accuracy of information as the study is limited by perception survey. Finally, face-to-face individual household interviews were conducted using the local dialect (Ilocano) in 2016.

2.4. Description of Survey Questionnaire

Trained enumerators administered a structured questionnaire to elicit enough information on the role of ecotourism in CRM. The questionnaire contained information on the respondent's socio-economic status, livelihood structure, income composition and awareness, knowledge, and perceptions on MPA, including their participation in its activities. The socio-economic component covered the basic information of the respondents (e.g., age, sex, educational attainment, household size, annual income, years in the community, membership in organizations, etc.). In addition, the livelihood structure and income composition contained information on the respondents' main occupation and side jobs, as well as their fishing assets and profile. The respondents' perceptions (perceived benefits from MPAs and perceived impacts of ecotourism) were generated through the use of pre-coded open-ended questions. The respondents answer the question in an open-ended way while the interviewer selects the appropriate response category from the list, which is not shown to the respondents so they can freely express their views. The respondents were also asked about the perceived effects of ecotourism on their family welfare, fishing activities, and involvement in MPA management.

2.5. Data analysis

The data collected from the island and mainland respondents were separately analyzed using descriptive statistics. In analyzing the factors affecting the residents' participation in MPA management, the response data were structured as binary: 1 if a respondent participates in any MPA management activities and 0 if there is no participation at all. Participation in MPA management means taking part in one or more of these activities: (1) overseeing the security of the MPA from illegal activities and enforcement of the laws; (2) conduct of coastal clean-up or waste disposal activities; (3) tourist management assistance in the MPA; and (4) organizing an information drive in the community on MPA concepts and guidelines.

The likelihood-ratio (LR) Chow test was conducted to determine whether the island and mainland data sets should be pooled or analyzed separately. Further, the interrelationship of variables was evaluated by probit regression analysis whereby the dependent variable (y), participation in MPA management, is a function of several explanatory variables (x). Following Wooldridge (2006), the probit model was derived from an underlying latent variable model:

$$y^* = \beta_0 + \beta x + u$$

where y^* is the unobserved, but what we do observe is,

$$y = 0 \text{ if } y^* \leq 0,$$

$$= 1 \text{ if } y^* > 0$$

β is the observable component which a function of measurable factors and u are certain unobservable factors. Assuming that u is normally distributed across observations, we normalize the mean and variance of u to 0 and 1, and we can calculate the response probabilities for $y^\star$ is less than or equal to y from the standard normal cumulative distribution function.

For the model building, exploratory variables were added to the theoretical variables to check whether they explain much variation in the dependent variable. All important predictors were considered in the model and deleted one at a time until reaching a point where the remaining variables all make significant partial contributions to predicting y. For the individual independent variable coefficients (βx), the sign conditions were used for interpretation. A positive coefficient means that an increase in the predictor leads to an increase in the predicted probability while a negative coefficient means that an increase in the predictor leads to a decrease in the predicted probability. Data sets were examined using the statistical software R.

3. RESULTS

3.1. Demographic profile of respondents

Table 1 shows the demographic profile of the respondents who participated in the one-on-one interviews. The household heads, mostly males, participated in the survey. Almost similar average age (42 years old) and roughly the same number of years in the area (31 – 33 years) is observed among the respondents from the island and mainland of the San Vicente village. The respondents from the island, however, have higher household size (5 – 6) and lower educational attainment (elementary level to elementary graduate) with an average of 5.3 years education compared with the mainland respondents with 4 – 5 household members and have reached high school level to high school graduate or an average of 8 years of schooling. Around 86% of respondents from the islands and 56% from the mainland were members of a fishers' organization. Different institutions customarily form these fishers' associations to forward the interest of the fishers in the area.

Table 1. Demographic characteristics of respondents

Parameters/Type of Villagers	Island	Mainland
Sample respondents (n)	96	234
Sex (Male : Female)	80 : 16	223 : 11
Average household size	5 - 6	4 - 5
Average age	42.06	42.32
Average years in the village Educational attainment	Elementary Level – Elementary Graduate	High School Level – High School Graduate
Members of fisherfolk organizations (%)	83	110

3.2. Livelihood structure and income composition

The majority of the respondents, both from the island and mainland, highly depend on fish and other coastal resources for their livelihood (Table 2). Aside from fishing and other related activities (e.g., gleaning, seaweed harvesting, etc.), the next main source of income of the island residents come from tourism-related activities (e.g., tour guide, homestay owners, boat operators, etc.) (25.39%) and earnings from a regular job (18.85%). On the other hand, the income structure of the households from the mainland came from earnings from rural non-fishing or non-agriculture (e.g., small enterprises, skilled laborers, etc.) (28.67%) and regular jobs (25.86%). Further, the island residents have an average household income of ₱34,970, which is relatively lower than the mainland residents, which is ₱80,150. Thus, the limited economic activities contributed to the low income of the island residents.

3.3. Perceived benefits of MPA

Most of the respondents from the island and the mainland perceived that an increase in the catch of fish and other marine products and a greater chance of catching bigger fish are the major benefits of the MPA (Table 3). In addition, respondents also recognized that the PIPLS contribute to the maintenance of the natural

Table 2. Annual household income and sources of income

Income parameters	Island	Mainland
Annual household income (Php)		
Mean	34,970	80,150
Gini coefficient	0.3833	0.3444
Median	25,250	70,000
Interquartile range	21,000	62,200
Income composition (%)		
Fishing and other related activities	50.85	34.93
Agriculture	1.83	1.13
Tourist-related activities	25.39	4.48
Regular job (Government/Private employee)	18.85	25.86
Rural non-fishing/non-farming	3.07	28.67
Other receipts (e.g. Overseas remittance, pension)	0.00	4.93

Table 3. Perceived benefits of respondents from MPA

Statement/Benefits	Island		Mainland	
	N	%	N	%
1. Increase in catch of fish and other marine products	70	72.91	116	49.57
2. Greater chance to catch older/larger fish	53	55.21	74	31.62
3. Maintain natural habitat (good cover of live corals, less dead coral reefs, etc.)	42	43.75	52	22.22
4. Maintain genetic diversity and enhance biodiversity	22	22.92	13	5.55
5. Protection against natural calamities such as strong waves and floods	27	28.13	63	26.92
6. Recreation and tourism purposes (snorkeling, swimming, photography, etc.)	52	54.17	42	17.95
7. Research and scientific exploration purposes	20	20.83	7	2.99
8. Increase in employment from tourism industries	34	35.42	56	23.93
9. No idea/ No answer	0	0.00	50	21.37
Tourist-related activities	25.39	4.48		
Regular job (Government/Private employee)	18.85	25.86		
Rural non-fishing/non-farming	3.07	28.67		
Other receipts (e.g. Overseas remittance, pension)	0.00	4.93		

habitats (e.g., coral covers, seaweeds, mangroves, etc.), development of recreation and tourism (e.g., snorkeling, swimming, photography, etc.), increase in employment from tourism industries, and protection against natural calamities (e.g., strong waves, floods, etc.).

3.4. MPA management structure and community participation

The PIPLS is primarily managed by the Protected Area Management Board (PAMB), composed of representatives from the 15-member organizations. This is headed by the Department of Environment and Natural Resources with members from other national agencies (Bureau of Fisheries and Aquatic Resources, Philippine National Police, Philippine Coast Guard, and Philippine Navy), local governments (Provincial, Municipal and Village), Government-Owned and Controlled Corporation (Cagayan Economic Zone Authority), Non-Government Organization (Process Luzon), and peoples' organizations (Palaui Environmental Protectors Association, Palaui-San Vicente Motorboat Association, Sta. Ana Motorboat Association, Sta. Ana Alliance for Social and Environmental Concerns, and IP-Agta Daket). This group acts as the policy-making body and decides for all activities in the MPA, including ecotourism development.

To implement the policies, a Protected Area Superintendent oversees the execution of the regulations in collaboration with the PEPA, the prominent people's organization that assists in managing PIPLS, which is composed of residents from the island. The voluntary activities for the MPA management include involvement in any of the following: law enforcement, coastal clean-up or waste disposal activities, tourist management assistance, and information education campaign. All community members are welcome to participate in any of these activities voluntarily. However, since the residents are not compelled to take part in any of these undertakings, only 71.8% and 16.3% of respondents from the island and mainland, respectively, participate in any of the mentioned activities with an itemization of involvement, as shown in Table 4. On the other hand, most of the respondents participate in law enforcement and coastal clean-up activities. The MPA is situated on the island, which may be the reason for the higher proportion of participation among island respondents than their mainland counterparts.

3.5 Institutional support

The PIPLS has strong organized support for livelihood development through ecotourism. Table 5 enlists the assistance various institutions provide supporting the protected area on the ecotourism development in PIPLS. The Community-based Sustainable Tourism Project in PIPLS was launched in March 2006 which was implemented by the Cagayan Economic Zone Authority (CEZA). This project aims to establish community-based enterprises that will economically encourage island residents and stakeholders to upkeep the pristine ecosystems of the island. The CEZA strengthened the PEPA, which was restructured to accommodate the delivery of a number of services for tourists. At present, sub-groups within the PEPA were created to develop their skills as tour guides, food caterers, reef rangers, spa providers and widen their expertise on other tourism-related projects using endemic products like honey and pandan leaves. In addition, a component of the Integrated Coastal Resource Management Program implemented by the DENR seeks to provide additional support for the improvement of ecotourism activities in the area. The project continuously capacitated the community to ensure better delivery of services to the tourists. Further, the PIPLS has an established user fee system used to fund the establishment of some ecotourism facilities such as visitor's information center and comfort room for tourists on the island.

Table 4. Community participation in MPA activities

MPA activities	Island		Mainland	
	N	%	N	%
Participate in MPA activities	69	71.8	38	16.3
Oversee the security of the MPA from illegal activities and enforcement of	26	37.68	14	36.84
Conduct of coastal clean-up and/or waste disposal activities	48	69.57	14	36.84
Tourist management assistance in the MPA	22	31.88	13	34.21
Organize an information drive in the community on MPA concepts and guidelines	1	1.45	5	13.16
Do not participate in MPA activities	27	28.2	196	83.7

Table 5. Institutional support on ecotourism development in PIPLS

Programs/Projects	Lead Agency	Remarks
1. Community-based Sustainable Tourism Project	Cagayan Economic Zone Authority	organised group of island residents and capacitated them in different skills including guideship services, community spa management, camp site development, trail management
2. Integrated Coastal Resource Management Project	Department of Environment and Natural Resources	provide sustainable livelihood through ecotourism
3. User's Fee (Access and Environmental Fee)	Department of Environment and Natural Resources (Protected Area Management Board) and Local Government Unit	establishment of facilities for ecotourism

3.6. Respondents' perceived effects of ecotourism

The development of ecotourism in the PIPLS has brought direct and indirect effects to local communities, particularly those involved in ecotourism activities. Respondents recognized the impacts of ecotourism on their family welfare, fishing activities, and involvement in MPA management. About half (55.21%) of the island respondents and 6.41% of the mainland respondents were involved in ecotourism activities. As mentioned earlier, the island respondents provide services to the tourist, while the mainland respondents earn income as boat operators. Most of the respondents (island = 54.72%; mainland = 66.67%) who were involved in ecotourism claimed that their family welfare somewhat increased since they joined ecotourism activities. Improvement of family welfare is measured by the increase of income derived from ecotourism undertakings.

However, despite the respondents' affirmation on improving their family welfare due to ecotourism, the fishing activities of most island respondents (71.74%) did not decline. They continue their fishing activities while being involved in ecotourism activities. In the case of mainland respondents, 77.78% declared that their fishing activities decreased in place of their involvement in ecotourism activities as their boats were now used to ferry tourists rather than for fishing. Moreover, the respondents professed an increase in support of MPA due to their involvement in ecotourism activities.

The respondents also divulged the positive and negative effects of ecotourism, as summarized in Table 6. Both island (41.58%) and mainland (38.38%) respondents identified job creation and livelihood opportunities as the main positive effect of ecotourism. Other positive impacts include increasing income, a sense of pride, establishing infrastructure, and better protection of the environment due to stricter rules.

Table 6. Perceived effect of ecotourism to family welfare, fishing activities, and involvement in MPA management

Particulars	Island	Mainland
	%	%
Involvement in the ecotourism activities		
Benefit in the ecotourism projects	55.21	6.41
Change in family welfare since joining the ecotourism activities		
Decreased substantially	-	-
Somewhat decreased	1.89	-
Remained the same	26.42	13.33
Somewhat increased	54.72	66.67
Increased substantially	16.98	20
Decrease in fishing due to ecotourism activities		
No	71.74	22.22
Yes	28.26	77.78
Increase support to MPA due to involvement in ecotourism activities		
No (the same)	26.42	-
Yes	73.58	100

Meanwhile, most of the respondents from the island (93%) discern that ecotourism has no negative effects or has no idea on its negative effects. However, some respondents identify dilution of culture (4.17%) and pollution (3.13%) as negative effects. In the case of mainland respondents, 50% claimed no negative effects while the rest identified depletion of resources, pollution, erosion of values, dilution of culture, incidence of petty crimes, and increase in the prices of goods as ecotourism's adverse effects.

3.7. Factors affecting participation

Table 7 shows the result of probit analysis on the determinants of participation among respondents. In the case of island respondents, the factors that affect participation include total household income, fishing household, benefit in ecotourism activities, and received any extension services. On the other hand, the factors that affect participation for mainland respondents are total household income, age, membership in fisher's organization, received any extension services, and belief in the perception statement that is necessary to protect the environment for the future generations.

This case study revealed that as income increases, the tendency to participate in MPA management also increases for both island and mainland data sets. Therefore, these results connote that the presence of potential sources of income, such as ecotourism, can increase the probability of residents being involved in the coastal resource initiative.

In addition, those who were more dependent on the coastal resources (fishing households or members of fisherfolk organizations) tend to participate in MPA management. This can be attributed to their aspiration to keep their source of livelihood. Membership in the fisherfolk organization tends to increase the likelihood of participating in MPA management. The organization usually has regular meetings where members have a chance to discuss things. Therefore, it is assumed that the learnings they received from their fellow fishers in the organization could help respondents develop a good perception towards MPAs, increasing their tendency to participate. For both the island and mainland data set, the support of the external agents in the extension support services, particularly in the information dissemination to increase their knowledge about the objectives and goals of MPA and promote ecotourism activities, also increases the probability of respondents to participate in its management.

Mainly for the island data sets, those who benefit from the ecotourism activities tend to participate in MPA management. In the case of mainland data set, older respondents and those who perceived that it is necessary to protect the environment for future generations are more likely to participate in MPA management. This can be attributed to their sense of attachment in the area and their high consideration for the resources' bequest value.

Table 7. Perceived positive and negative impacts from ecotourism

Impacts	Island		Mainland	
	N	%	N	%
A. Positive impact				
1. Increase in income	55	57.29	103	44.02
2. Job creation and livelihood opportunities	79	82.29	140	59.83
3. Sense of pride	31	32.29	25	10.68
4. Better infrastructure	10	10.42	9	3.85
5. Better protection of the environment due to more strict rules	11	11.46	8	3.42
6. No idea on the benefits/No answer	4	4.17	80	34.19
B. Negative impact				
1. Depletion of resources	0	0.00	24	10.25
2. Pollution	3	3.13	76	32.48
3. Erosion of values	0	0.00	6	2.56
4. Dilution of culture	4	4.17	8	3.42
5. Incidence of petty crimes	0	0.00	18	7.69
6. Increase in the price of goods	0	0.00	4	1.71
7. No negative effects	67	69.79	53	22.65
8. No idea on the negative effects/No answer	22	22.92	80	34.19

multiple response

Table 8. Determinants of participation on the management of PIPLS

Variable	Type of variable	Islander data set	Mainland data set
Total household income	numerical	0.0000564** (2.015)	0.00000581*** (2.760)
Age	numerical	-	0.03981*** (3.237)
Fishing household	dummy (1 = yes; 0 = no)	2.948*** (2.801)	
Member of fisher's organization	dummy (1 = yes; 0 = no)	-	0.5918** (2.015)
Benefit in ecotourism activities	dummy (1 = yes; 0 = no)	2.629** (2.382)	
Received any extension services	dummy (1 = yes; 0 = no)	2.457*** (4.307)	3.913*** (5.653)
Perception statement (necessary to protect the environment for the future generations)		-	0.4271** (2.539)
Nos. of observations		96	234
Loglikelihood		-17.18	-47.52
McFadden's R Square		0.688	0.481
AIC		44.35	107.03

***Statistically significant at the 1% level or better; **at the 5% or better, * the 10% level or better.
Values in parenthesis are z-value

4. DISCUSSIONS

Most of the respondents are into fishing and fishing-related activities, which signifies the tremendous economic dependency of the households on the coastal resources. The results showed that generally, the villagers earn 65 - 85% less than the national average (PHP 235,000) and 58 - 82% less than that of the regional average (PHP 195,000) (FIES, 2012). The Gini coefficient for the island respondents is 0.3833, whereas on the mainland it is 0.3445, indicating a wide disparity of household income among the respondents. Further, based on the annual household poverty threshold in the country, which is recorded at PHP 108,780 and PHP 105,430 in the rural areas of Cagayan (PSA 2016), this study found out that 85.3% of the respondents from the San Vicente village were below the poverty threshold level of the province. This supports the widespread notion of the commonly observed poverty level in coastal communities

Coastal areas are usually left with limited to no other options for livelihood diversification. The development of ecotourism is seen to contribute to the limited source of income in the coastal areas. The MPAs contribute to poverty reduction by improving household incomes by creating new jobs, particularly in tourism, such as in Apo Island, Philippines, where tourism has surpassed fishing as the largest source of income (Leisher et al. 2007). This is also the same in the case of Boracay Island, Philippines where there is a decrease in the number of locals who focus on fishing only and are instead opting for better employment opportunities in the tourism industry (Takashi et al. 2011). Thus, the economic contribution of tourism can change the livelihood structure of the community.

In this case study, however, the respondents from the islands revealed that their fishing activities did not reduce despite recognition of improved family welfare with benefits received from ecotourism. This result figures out two possible reasons: first, on the income contribution of the ecotourism activities as an alternative livelihood and second, considering that fishing is the traditional occupation of the respondents. It is therefore essential to look at the contribution of income from this kind of intervention. The income from tourism should be higher than or at least comparable with that of fishing to ensure the reduction of extraction of marine resources. Ireland et al. (2004) expressed that to prevent the overuse and degradation of the coastal resources, one of the solutions is providing alternative income-generating activities that enable people to shift from

the extraction or environmentally degrading activity that they are presently obtaining their means of living. Further, as fishing is considered a conventional activity of the community, it is important to understand the motivations and intentions of the group in the introduction of alternative livelihood projects. Slater et al. (2013) noted that successful actions to reduce fishing pressure necessitate understanding the livelihood strategies and fishers' decisions to exit or stay in fishing. Alternative livelihood options are viable and effective in reducing fishing pressure if it is attractive to the fishers to be willing to withdraw the fishery activities. Nevertheless, these results showed that besides ensuring inclusive economic growth involving the residents themselves in the ecotourism activities, participation and involvement in MPA management could be encouraged.

The respondents' perceptions of the negative effects of ecotourism support Vishwanatha and Chandrashekara's (2014) findings that when local people interact with and earn money from tourists, they tend to commercialize their culture (e.g., traditional cultural performance and other cultural practices) to show-off to tourists. In addition, Sebastian and Rajagopalan (2009) and Acquah et al. (2017) found out that there is an increase in the price of some necessary products due to ecotourism activities as observed in India and Ghana, respectively. The appropriate level of protection and conservation of resources in MPAs with ecotourism activities should therefore be considered.

Nonetheless, the findings of this present study suggest that several positive effects of ecotourism prevail over the negative impacts, so the local community is optimistic towards this intervention.

These results confirm that ecotourism, especially with adequate income generated from its related activities, can encourage residents to actively involving themselves in coastal resource management. As they acknowledge the potential of ecotourism as a possible source of income, ensuring the maintenance and conservation of the resources is tantamount to their livelihood.

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

The study area showed a high incidence of poverty among the respondents, common among coastal areas in the country. This study disclosed that residents, particularly from the islands, welcome ecotourism development in the area as they can see a promising alternative source of income. The link between improved quality of life among villagers and improved environmental conditions is not that clear and is subject to further study; however, a relation on the participation to ecotourism of the respondents and increase support to resource management and conservation initiatives were established. At present, the ecotourism enterprises have seen promoting inclusive growth as the local community was organized to be the leading tourism industry players.

The result affirmed that a transformation in livelihood structure could be possible as indicated by the favorable change in resource extraction through a decrease in the fishing activities in place of ventures in ecotourism, particularly that of the mainland. However, further research to quantify the change in resource extraction could strengthen this claim.

With this, the following are recommended to ensure sustainable ecotourism, considering its social and economic viability and a part of coastal resource management.

(1) Income positively affects the participation of residents in MPA management; therefore, there is a need to scale up ecotourism initiatives to generate greater economic incentives for both island and mainland residents. The "infant industry argument" can be considered a way to promote thriving ecotourism within the MPA as this would provide promotional incentives for the residents to start an investment. As it would be difficult for individuals or residents to capitalize on facilities necessary in emerging ecotourism facilities (e.g., parking area, visitor's center, toilets, etc.), it is recommended that the government intervene by providing subsidies or any other intervention programs to support the construction of such facilities. With this, many residents can start tourism-related businesses and will increase their income from ecotourism. This type of government intervention would help ensure inclusive growth, as the community would be encouraged to start businesses rather than capitalists from outside the area. The government will support only the initial investments, and after that, it is expected that the ecotourism business of the residents will be self-sufficient.

(2) Ecotourism management plan (i.e., tourists' visits, ecotourism development, etc.) should be in place to ensure sustainable ecotourism without foregoing the ecological objectives of MPAs taking

into consideration the adverse effects as perceived by the respondents so as the appropriate level of protection and conservation of the resources be considered in the plan.

(3) As income drives participation in MPA management, other possible types of profitable, sustainable, and non-resource-dependent livelihood should be considered for the community. Furthermore, the local community should be consulted on any alternative livelihood projects to be introduced so that their motivations and traditional knowledge will be considered for a more successful intervention.

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AUTHOR CONTRIBUTIONS

Ballad EL: Conceptualization, Methodology, Investigation, Formal analysis, Writing—original draft preparation, Writing—reviewing and editing, Visualization, Project administration. **Morooka Y:** Conceptualization, Investigation, Supervision, Formal analysis. **Shinbo T:** Conceptualization, Methodology, Supervision, Investigation, Funding acquisition.

CONFLICTS OF INTEREST

The authors declare that there is no conflict of interest in any way.

ETHICS STATEMENT

The authors obtained informed consent from all participants for inclusion in the study. As the study was conducted in a protected area, the authors also obtained consent from the Protected Area Management Board.

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