

Conservation-based Alternative Livelihood as Key to the Sustainability of Marine Protected Area for Irrawaddy Dolphins in Negros Occidental

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Abstract

The establishment of a marine protected area (MPA) in the coastal waters of Bago City and Pulupandan is crucial in ensuring the conservation of the habitats of the Irrawaddy dolphin, a rare and critically endangered species of dolphin. Its effectiveness relies not upon only good governance by the said local government units but also on the participation of fisherfolk communities. The study assesses the economic and livelihood condition of fisherfolk households to determine conservation-based alternative livelihoods that they can engage with to augment their family incomes, especially during the off-fishing season. An alternative livelihood assessment survey was conducted among 400 sampled household participants and to determine viable conservation-based alternative livelihoods, livelihood planning workshops were conducted among leaders of fisherfolk organizations. The study reveals that fisherfolk communities are generally poor and most households live below the poverty line. The incidence of hunger among them is high and is worst during the off-fishing season as they can hardly find alternative sources of income. They possessed strong entrepreneurial skills and attitudes and they have expressed willingness to venture into alternative livelihoods especially related to the environment and conservation. Among the top three livelihoods recommended, handicrafts such as shell crafts and “pandan” weaving were considered the most viable alternative livelihood. Alternative livelihoods related to eco-tourism and mangrove reforestation are also encouraged.

Keywords: *conservation-based alternative livelihood, marine protected area, Irrawaddy dolphins*

Introduction

The Guimaras strait that includes the coastal waters of Bago City and Pulupandan has been known as critical habitats for some coastal marine species, especially the Irrawaddy dolphin (*Orcaella brevirostris*), which is known to fisherfolks as “lumba-lumba” and is a rare and critically endangered species of dolphin. The recent study of De la Paz (2017) showed a further decline in its population to a mean of only 13 dolphins as compared to the 2014 estimate by the Silliman University-Gessellschaft fur Internationale Zusammenarbeit (SU-GIZ) of 21 dolphins. This dwindling population of Irrawaddy dolphins and the decline in fish-catch production (Pacalioga, 2017) are indicators of the critical condition of the said habitats, which also explains why fisherfolk households in the nearby coastal communities mostly live below the poverty line (Quezon et al., 2017). Camacho (2014) reported that fishing can no longer support a viable

livelihood because of declining fish catch, which explains why municipal fisherfolks are in a vicious cycle of poverty.

The establishment of a marine protected area (MPA) in the coastal waters of Bago City and Pulupandan is crucial in ensuring the conservation of the habitats of the Irrawaddy dolphin and other endangered marine species. MPAs are considered an important instrument for conservation and fisheries management and can protect habitats, ecosystem structure, functioning and integrity, and species diversity, richness, size, and density (Benett et al., 2013). Charles et al. (2016) assert that successful MPA requires a combination of effective management and conservation frameworks, maintenance of decent fisheries livelihoods, and a governance system that allows effective participation of coastal communities.

The participation of coastal communities in Bago City and Pulupandan is a vital factor towards the

success of establishing a marine protected area (MPA) and its sustainability. They have to be strategically engaged in alternative livelihoods that would address their poverty condition, especially during the off-fishing season, and at the same time lessen their dependence on fishing. The socio-economic component of the PAME-GIZ project identified alternative livelihoods as important mitigating activities in the success of MPAs and recommended the need to organize communities for livelihood training (Quezon, 2017).

However, the challenge is on how to transform fisherfolk communities to become defenders or conservation partners as they were assessed in the stakeholders analysis as a latent group or those stakeholders who are not interested in establishing the MPA for Irrawaddy dolphins but their actions are considered crucial in sustaining it (Aguilar, 2017). To address this challenge requires community organizing that would capacitate their community organizations not only as partners in the conservation of the habitats but also in the management of alternative livelihood projects.

In determining an alternative livelihood program, it is better to focus on either enhancing the existing livelihood strategies of the fisher folks or livelihoods that have a clear link to conservation and promote good community relations (Wright et al., 2016). This concept

of conservation-based alternative livelihood is attuned to the ecosystem-based adaptation (EbA) which has become the preferred adaptation approach to climate change in the least developed and developing countries (Nalau, et al., 2017). Ecosystem-based adaptation in coastal areas should build on the existing sustainable management practices, institutions, and traditional knowledge of local people, including the ability to predict disasters (Mallapaty 2012 as cited by Swiderska, et al., 2018).

This research was undertaken to describe and analyze the socio-economic condition of the fisherfolk households in the coastal communities of Bago City and Pulupandan, Negros Occidental, and to assess conservation-based alternative livelihood options for them that would increase their income and at the same time enable them to play an active role as conservation partners for the marine protected area (MPA) for Irrawaddy dolphins in their coastal waters.

Materials and Methods

Study Sites

The study was conducted in the City of Bago and Municipality of Pulupandan, the two neighboring local government units (LGUs) in the Fourth District

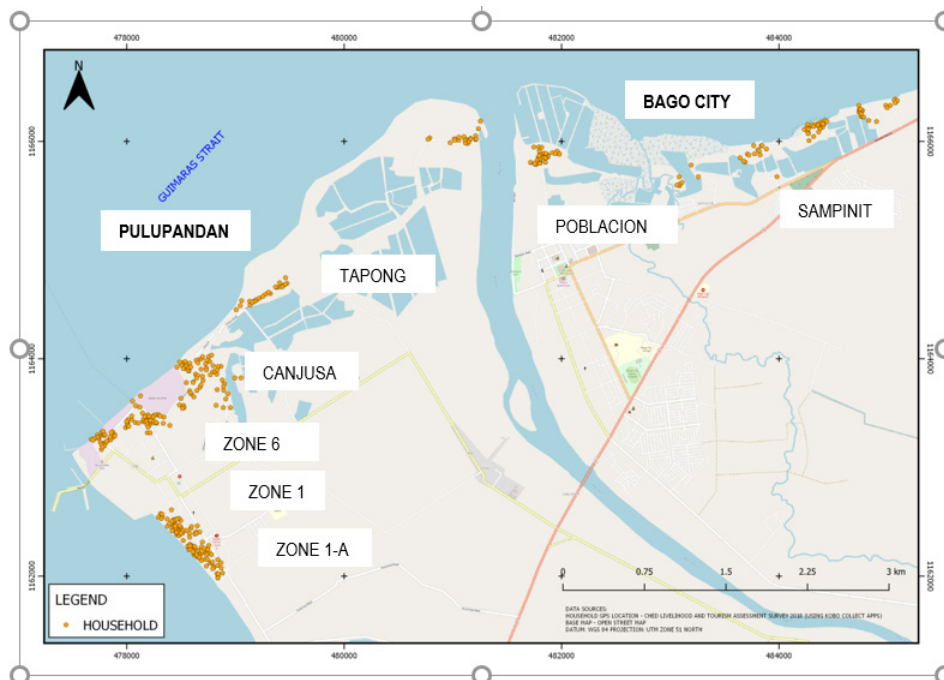


Figure 1 Map showing the study sites in the coastal barangays of Bago City and Pulupandan

of Negros Occidental, whose coastal waters are known habitats of the critically endangered Irrawaddy dolphins. The research sites were the coastal barangays of the said LGUs and were partner-communities of the Center for Research and Engagement, University of St. La Salle (CRE-USLS) in the conduct of research in 2015-2016 on the conservation and management enhancement of Irrawaddy dolphin habitats under the Protected Areas Management Enhancement Program (PAME) funded by GTZ-Germany. As shown in Figure 1, five coastal barangays in Pulupandan were covered by the study, namely; Barangay Zone 1, Barangay Zone 1-A, Barangay Zone 6, Barangay Canjusa, and Barangay Tapong while in Bago City, two coastal barangays were involved namely: Barangay Poblacion and Barangay Sampinit.

Livelihood Assessment Survey

An interview schedule type of survey was used for the conduct of the livelihood assessment survey. The participants of the livelihood assessment survey were the households in the coastal barangays of Bago City and Pulupandan. An interview schedule type of questionnaire was constructed which is made of the following parts: 1) Participants Background Information, 2) HH Socio-demographic Information, 3) HH Economic Information, and 4) Livelihood Assessment and 4) Perception on MPA.

The socio-demographic and economic sections of the Community-Based Monitoring System (CBMS) Survey Form were adopted and modified. To capture the entrepreneurial skills and behavior, a six-point Likert scale was used, where 1 represented a point of “strong disagreement” and 6 represented a point of “strong agreement”. For the entrepreneurial attitudes, the nine attributes of a business entrepreneur were adopted and they are as follow: 1) risk-taking propensity, 2) tolerance for ambiguity, 3) creative, 4) determined, 5) innovative, 6) self-confidence, 7) independent, 8) action-oriented, and 9) need for achievement.

To ensure the validity and reliability of the interview schedule, it was translated to the local dialect, i.e. “*hiligaynon*” and then pretested in two barangays adjacent to the surveyed barangays in Bago City and Pulupandan. The pretested questionnaires were encoded and the results were subjected for a reliability test, using Cronbach Alpha and it yielded a result of .89 indicating that the instrument was reliable as it was not below 70.

The final interview schedule for the alternative livelihood assessment survey was encoded on a tablet using “Kobol” apps. Ten enumerators or interviewers were hired to compose a survey team and they were given an orientation and training on the basics of interviewing and on how to conduct the survey using a tablet.

Sampling Design. The household population of the seven coastal barangays of Bago City and Pulupandan was obtained and tallied. A total of 2,731 households were tallied consisting of 1,987 households from Pulupandan and 744 households from Bago City. Based on the aggregate household population of the two areas, the sample size was computed using the Sloven formula at a 5% margin of error as shown below and was proportionately distributed in the seven barangays. The sampling technique used was systematic representative random sampling. Table 1 shows the sampling distribution by barangay.

$$n = \frac{N}{1 + Ne^2} \quad n = \frac{2,731}{1 + (2,731 \times .05^2)}$$

$$n = 349 \text{ (increased to 400)}$$

Where:
 N: Total HH population of 7 coastal barangays
 e: Margin of Error (5%)

Table 1 Sampling distribution of household participants by barangay

Area/ Barangay	HH Population	Percent	Sample Size
Pulupandan			
Zone 1v	360	0.13	53
Zone 1-A	345	0.13	51
Zone 6	513	0.19	75
Canjusa	467	0.17	68
Tapong	302	0.11	44
Sub-Total	1987	0.73	291
Bago City			
Sampinit	497	0.18	73
Poblacion	247	0.09	36
Sub-total	744	0.27	109
Overall Total	2731	1.00	400

Statistical Analysis. The study used descriptive statistics such as the use of frequency distribution, percentile analysis, and central tendencies, like mean and median in the analysis of data. They were very useful in describing the socio-demographic and

economic conditions, and in livelihood assessment. Chi-square and T-Test were used to test whether there is a significant difference in the entrepreneurial attitudes and behavior of household participants when they are grouped according to the status of their community organization.

Participatory Livelihood Planning Workshop

Livelihood planning workshops were conducted and participated by the leaders of fisherfolk organizations in Bago City and Pulupandan. The purpose of the workshop was to ensure the participation of the fisherfolk organizations in determining doable conservation-based livelihoods that they can engage with and come up with their organizational livelihood action plans.

Results

Brief Profile of Fisherfolk Communities

Fisherfolk Communities in Bago City. Bago City has 24 barangays and five of which are coastal barangays with a total coastal stretch of 15 kilometers. As projected for the year 2015, the total household population of coastal barangays is 12,138 or 6.9% of the total household population of the city of 176,662. Most of the settlements in the coastal barangays are located within 500 meters from the shoreline. Houses are made of light to semi-concrete materials. The residents are mostly fisherfolks who are dependent on fishing. They experience yearly worst poverty during the off-fishing season from November up to March due to a lack of alternative sources of income. Just like many coastal areas, settlements contribute to the pollution of the seawater because of the garbage dumped and the sewage directly flowing to the shore.

Barangay Poblacion and Barangay Sampinit are two coastal barangays of Bago City whose coastal waters are considered part of the habitats of the Irrawaddy dolphins. The barangay as of 2015 has a total population of 11,224 comprising more or less of 2,359 households. As of 2015, Barangay Sampinit has a total population of 6,832 comprising more or less of about 1,366 households.

Fisherfolk Communities in Pulupandan. Pulupandan is predominantly a coastal community with 11 out of its 20 barangays classified as coastal areas with a total coastal stretch of about 12 kilometers.

Most of the settlements are located within a 500-meter distance from the shoreline and houses are mostly made of light to semi-concrete materials. As of 2015, the 11 coastal barangays have an aggregate population of 18,956 representing about 75% of the total municipal population. Toilet remains a major concern for fisherfolk communities and many of the fisherfolks still dispose of their human wastes in the shoreline. Among the 11 coastal barangays, only six are directly affected by the proposed MPA for Irrawaddy dolphins, and below are their brief profiles.

Barangay Zone 6. Based on the census as of 2015, the total population of Barangay Zone 6 was 2,940 composed of about 513 households. Its residents are mostly fisher folks who mostly depend on fishing and related activities as major sources of income. The majority of the Tangaban operators and fish workers mostly come from this barangay. They are directly affected because their “tangabs” are located within the area of the proposed MPA for Irrawaddy dolphins. Other than fishing, a number of the residents also work in Asian Alcohol, which is located within the barangay.

Barangays Zone 1 and Zone 1-A. Zone 1 and Zone 1-A are adjacent coastal barangays that share more or less similar economic and demographic characteristics. Other than fishing, other sources of livelihood of the residents are ambulant vending, as trisikad and tricycle drivers, and small businesses such as a sari-sari store, eatery, and coffee shops. Based on the 2015 census, Barangay Zone 1 has a population of 1,581 comprising 360 households while Barangay Zone 1-A has a population of 1,417 composed of 345 households. Barangay Zone 1-A is a more organized community as it has an active fisherfolk organization. In the case of Barangay Zone 1, an organization exists composed mostly of women but it is considered not organized yet because it is managed by a core group and has no constitution and by-laws yet.

Barangay Canjusa. As of 2015, the total population of Barangay Canjusa was 1,991 composed of about 467 households. The residents are mostly fisherfolks who are very dependent on fishing and related activities as their major source of income. The community is largely unorganized.

Barangay Tapong. Barangay Tapong is a typical coastal community where most of its resident-fisher folks largely rely on fishing and related activities as a major source of income. It has a population of 1,168 individuals based on the 2015 census composed of

about 302 households. There are two active people's organizations that exist namely, AIMAC (Ang Imol nga mga Mangingisda sa Cavan) and Farmers/Fisherfolks Association of Barangay Tapong. AIMAC is a small fishermen organization composed of about 50 members while the latter is a composite organization of small farmers and fishermen in Barangay Tapong with about 15 members.

Participation in Environment-Related Programs and Activities

The majority of the household participants signified their willingness to participate in programs or activities related to environmental protection and conservation (97%), and protection of their coastal marine resources (98%). Specifically, as to whether they would also participate in programs and activities related to the protection of Irrawaddy Dolphins or "lumba-lumba", the same majority (98%) of them expressed their willingness.

Awareness of Marine Protected Area (MPA)

MPA awareness among household participants is generally low. The majority 66% of them are not aware of it and only 34% have indicated that they know about it. Comparatively, more household participants in unorganized communities are not aware of what an MPA is at 68% as compared to those in organized communities at 64%. The most common answers on the benefit of MPA on their community are as follow: as follow: 1) it can protect the coastal marine resources (20%), 2) it can protect endangered species like Irrawaddy dolphin, 3) source of livelihood (15.35%), 4) it can stop illegal fishing (15.18%), and 5) fishes will be abundant (15%).

Household Socio-Economic Condition

Employment

Unemployment among households in coastal barangays of Bago City and Pulupandan registered an incidence rate of 33.5%. On the number of household members gainfully earning, around 72% of all households have one member working and some 22% have two. The overall mean number of household members earning is 1.35, which means that for every household, about 1 to 2 household members are working. Taking into account the average household size of 4.86, the dependency ratio is 3.6, which means that one working household member is burdened to support 3 to 4 household members.

On the actual status of work, 8 in every 10 households claimed they have members gainfully working on a seasonal basis and only 22.25% employed permanently. About 1 in every 4 households has members working on a contractual or casual basis.

Entrepreneurial Activities

Reflective of the livelihood condition of the household participants are their entrepreneurial activities. Fishing remains a major entrepreneurial activity as claimed by 88% of them. The next major entrepreneurial activity is wholesaling and retailing, where about 21% are engaged especially in Pulupandan where about 50 households claimed they are engaged in it. Other notable entrepreneurial activities are those related to community, social, recreational, and personal services (10%) such as *hilot*, carpentry, *manicurista*, and others; transportation, storage, and communication services (8.5%) like tricycle driver; construction work (8.5%), which is notable in Pulupandan; and livestock and poultry raising (5%).

Household Income

About 8 in every 10 households do not earn any income from salaries and wages and only 21% have claimed they have members who are formally employed earning salaries and wages and the mean monthly salary is PHP 9,525.15. More than half (58%) do not have other sources of income and this unemployment is even more evident in Bago City at 63.89%. For some 42% of households who have other sources of income, the mean monthly income they earn is PHP 4,405.26.

More than half (52%) of the households have a total monthly household income of PhP 15,000 and below. The mean total monthly household income is PhP 12,260.60 and this is slightly above the poverty threshold income of PhP 10,481.00 for a family of five based on the 2015 National Income and Expenditure Survey of the Philippine Statistics Authority (PSA). While the average monthly incomes of households are above the poverty threshold, one cannot deny the fact that more than half of them have a monthly household income of PhP 10,000 and below, which is below the poverty line.

Juxtaposing the household incomes of organized and unorganized communities, the results show that the former registered a higher mean monthly income of PhP 13,341.69 as compared to the latter that registered only a mean of PhP 12,098.19. More than half (53%) of the households in unorganized

communities live below the poverty line as their total monthly household incomes fall below PHP 10,000.00. This shows that generally, households in organized communities are slightly better compared to those who live in unorganized communities.

Incidence of Hunger

About 3 in 10 households in Bago City and Pulupandan had experienced hunger or “*gutom*” in the past year from the time of the survey period. Among the two areas, Bago City registered the highest hunger incidence where 4 in every 10 households admitted that they experienced hunger. As shown in Figure 2, the month with the highest incidence of hunger is August (28.63%), followed by July (12%). These months are the peak of the off-milling season of the sugar industry or the time of “*tiempos muertos*”, where the local economy of Negros in general experiences hardship and impoverishment. Other than the seasonal cycle of poverty in the sugar industry, they are also affected by the annual seasonal cycle of weather.

The incidence of hunger starts at 7.63% in February and increases in January at 9.4% and gradually declines in March (8.4%) and April (6.49%). In the case of Bago City, the months from January to March, consistently have a high incidence of hunger at 10.89%, and these are the months considered as an off-fishing season because of the “*amihan*” or the season of north-east monsoon characterized by harsh winds and waves. However, for fisher folks in Pulupandan, they consider the months from July to September as off-fishing season because it is the season of “*habagat*” or southwest monsoon, where the waves are generally harsh and

dangerous for fishing.

Fishing Condition

The incidence of hunger goes along with the fishing season. For instance, the month of August is considered as the leanest season for fishing (14.15%), followed by January and February at 9.59% and 9.27%, respectively. Both Bago City and Pulupandan show a similar pattern of fishing seasons except that more fisher folks are affected in Pulupandan during “*amihan*” (January to March), while in Bago City, more fisher folks are affected by “*habagat*” (July to September).

In finding alternative work during the off-fishing season, nearly half (46%) of fisherfolk households tried to find means of living within their community only, while others went to nearby barangays (18.95%), within the town or city (12.7%), and other towns or cities (14.45%). Interestingly, more fisher folks in Pulupandan ventured to work outside of their town (15.76%), while more fisher folks in Bago City decided to find means of livelihood in nearby barangays (21.53%) and within the City (18.75%).

Problems Encountered Related to Livelihood

For household participants, fishing remains their main livelihood. Major problems they encountered related to livelihood are 1) big harsh waves (69.75%), seasonal weather cycle of “*amihan*” and “*habagat*” (53.5%), 3) typhoons (16%), and 4) small fish-catch (8.75%). About 92% of them in Bago City identified the seasonal weather cycle of “*amihan*” as their major concern. For those in Pulupandan, they blamed typhoons (19.18%).

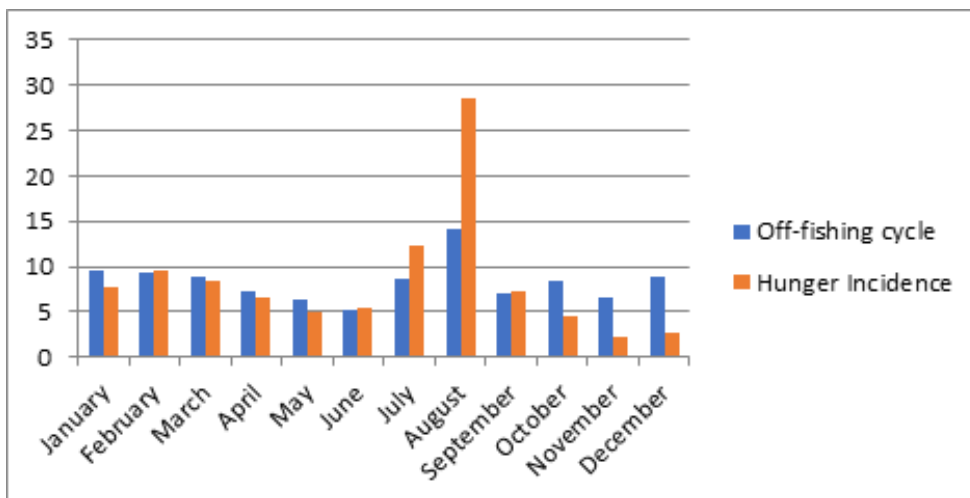


Figure 2 Annual cycles of off-fishing cycle and incidence of hunger in Bago City and Pulupandan

The natural seasonal weather cycle and the lack of job opportunities that followed with it are the primary obstacles to livelihood for fisherfolk households.

Status of Community Organization

Fisherfolk communities in Bago City and Pulupandan have a low level of organizations as only 2 in 10 households admitted that they are members of a fisherfolk organization. When asked about their positions, a majority (81%) said that they are members only and some 19% are officers of their organizations. In terms of the status of the organization, a majority (80%) of them claimed that they are active. But for the 20% who said that their organization is not active, they cited the disintegration of members due to lack of cooperation and participation (50%), and that their organization is just newly formed (28.57%) as major reasons.

Alternative Livelihood Assessment Livelihoods Engaged During Off-Fishing Season

During off-fishing season, most of the household participants were engaged as ambulant vendors peddling food or anything that can be sold (38.75%). Other common alternative livelihoods they were engaged with were “panginhas” or shell gathering (13%), working in the government (12%), and any odd jobs within the barangay such as laundry and as a helper (11%). Some resorted to carpentry works (6.5%), tricycle drivers (5.5%), “panghudhud” or shrimp catching (4%), sari-sari store (3.5%), and “kargador” or load hauler (3.5%). However, there are peculiarities in

terms of alternative livelihood between the two areas. In Bago City, more were engaged in “panginhas” or shell gathering (23%), while in Pulupandan more were engaged as ambulant vendors (40.75%).

Given the above alternative livelihoods engaged during the off-fishing season, it can be inferred that they were very limited, which explains why many fisherfolk households suffer from impoverishment. But when asked whether they received any assistance or help from any organization, a big majority of them (85.79%) said none. For those who claimed they received assistance, they got them from LGUs and government line agencies (12.47%) and NGOs/POs (1.75%).

Alternative Livelihood Training

An overwhelming majority 96.5% of the household participants expressed their willingness to join an alternative livelihood training related to the environment. But for those who expressed unwillingness, they cited their health condition (61.54%) as their primary reason and other reasons are no time (15%), having too many obligations (15%), and has a special child to attend to (7.69%). Furthermore, they were also asked if they would be willing to participate in the said alternative livelihood and significantly, the same overwhelming majority (96%) of them said yes.

Resources that can be Tapped for Alternative Livelihood

The following are the local resources that can be tapped for alternative livelihood, household-

Table 2 Mean Scores on Entrepreneurial Skills and Behavior

Entrepreneurial skills and behavior	Pulupandan	Bago City	Overall
1. After attending all the training conducted in my barangay, I feel that I am capable of coming up with a new product or business	4.31	4.12	4.25
2. I am willing to accept the challenges in running a new business	5.31	5.35	5.33
3. I take responsibility for the successes and failures of projects that I initiated	5.54	5.25	5.45
4. I like interacting and working with other people	5.51	5.12	5.38
5. I can communicate my ideas clearly with my co-workers/community members	5.51	5.18	5.4
6. I can be a good leader of a group	4.8	4.29	4.63
8. I can follow instructions given by a senior or leader in the community	5.54	5.29	5.46
Overall	5.21	4.94	5.12

participants in Pulupandan identified the following as their major resources: 1) “hipon” or small shrimps and “ginamos” or Shrimp paste (30.48%), 2) “tahong” and green shells (22.26%), 3) “pakinason” or shells, 4) “Sisi” (20%), and shrimps (12%). On the other hand, those in Bago City identified the following as their major resources: 1) “pakinason” or shells (60%), 2) “tahong” and green shells (22%), 3) coconut (20%), and 4) “sisi” (15%). Overall, the local resources found to be abundant in the two areas are 1) “pakinason” or shells (32%), 2) “hipon” and “ginamos” (23.5%), 3) “tahong” and green shells (23%), 4) “sisi” (18%), and 5) “pasayan” or shrimps (10%).

When asked what possible alternative livelihood they can suggest, most of the household participants recommended having capital so that they can engage in peddling or ambulant vending of food and fish products (40.75%), eatery or coffee shop (13.50%), and sari-sari store (11.5%). Looking at the particularities in the two areas, quite some household participants in Pulupandan want to engage in “ginamos” or shrimp paste making (14%), dried fish/salted “tahong” making (7.53%), and handicrafts such as pandan weaving, bags, rugs and pot holders making (7.88%). Interestingly, there are still some 7.75% of the household participants in the two areas who still identified fishing as their alternative livelihood.

Livelihood Already Established by Household Participants

Whether they have already established a business of their own, only 23.75% of the household participants

claimed they have, while the majority 76.25% said they have none. As to the kind of business, the most common are sari-sari stores (25.26%), ambulant vending (22.11%), “karenderia” or eatery (11.58%), and “kapehan” or Coffee shop (6.32%).

Assessment of Entrepreneurial Skills and Attitudes

Entrepreneurial Skills and Behavior

A six-point Likert scale was used to assess entrepreneurial skills and behavior where 1 represents the point of “strong disagreement” while 6 represents the point of “strong agreement”. They were asked to give their assessment on the seven statements related to entrepreneurial skills and the interpretation of the degree of their agreement is based on the mean score of their assessment.

As shown in Table 2, household participants rated themselves strongly in the following statements: 1) willingness to accept challenges in running a new business, 2) taking responsibility for success and failure, 3) interacting and working with other people, 4) communicating ideas clearly with co-workers or community members, and 5) following instructions given by a senior or leader in the community. Given the overall mean score of 5.12 for entrepreneurial skills and behavior, they assessed themselves to have very good entrepreneurial skills.

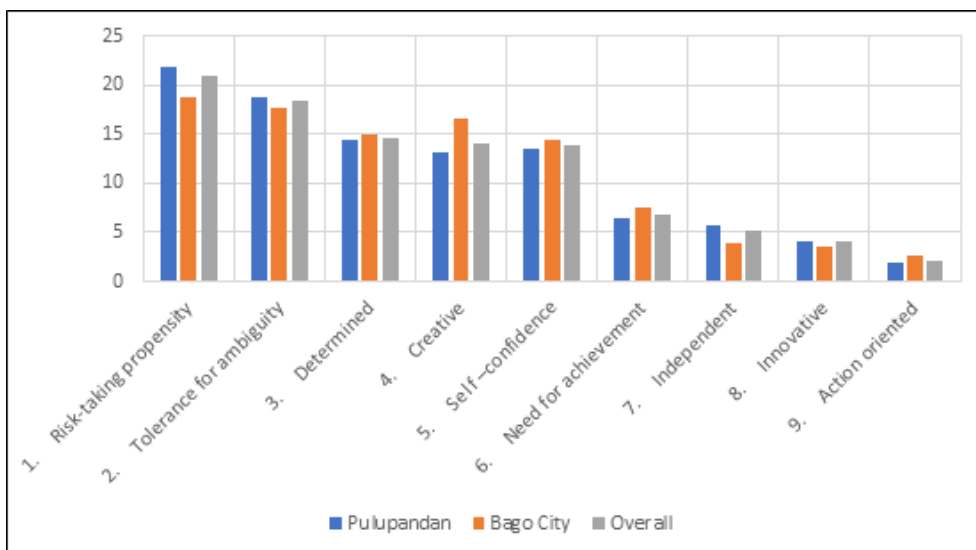


Figure 3 Most important attributes of a good entrepreneur/businessman that participants possessed

Entrepreneurial Attitudes

The entrepreneurial attitudes were measured based on the nine attributes of a successful entrepreneur and they are as follow: 1) need for achievement, 2) risk-taking propensity, 3) tolerance for ambiguity, 4) independent, 5) creative, 6) innovative, 7) action-oriented, 8) self-confidence and 9) determined. Based on these attributes, they were asked to rank them according to the following: a) three most important attributes, b) three most unimportant attributes, and c) three attributes they possessed.

Table 3 Cross-tabulation of most important entrepreneurial attitudes and status of the organization

Entrepreneurial Attributes		Status of Organization		Total
		Organized	Unorganized	
Need for Achievement	Freq.	22	16	38
	Percent	8.7%	10.9%	9.5%
Risk-taking Propensity	Freq.	74	31	105
	Percent	29.2%	21.1%	26.3%
Tolerance for Ambiguity	Freq.	44	31	75
	Percent	17.4%	21.1%	18.8%
Independent	Freq.	7	6	13
	Percent	2.8%	4.1%	3.3%
Creative	Freq.	35	18	53
	Percent	13.8%	12.2%	13.3%
Innovative	Freq.	4	6	10
	Percent	1.6%	4.1%	2.5%
Action Oriented	Freq.	6	2	8
	Percent	2.4%	1.45	2.0%
Self-Confidence	Freq.	27	16	43
	Percent	10.7%	10.9%	10.8%
Determined	Freq.	34	34	21
	Percent	13.4%	13.4%	14.3%
Total	Freq.	253	147	400
	Percent	100.0%	100.0%	100.0%

Among the nine entrepreneurial attributes, household participants of Bago City and Pulupandan considered risk-taking propensity as the most important attribute (21%), followed by tolerance for ambiguity (18%), and determined (14.58%). In contrast, they considered the need for achievement (19.88%), independent (19.13%), and action-oriented (16.67%) as the least important entrepreneurial attributes. Moreover, when asked which among the nine

entrepreneurial attributes they felt they already have, household participants cited the following attributes: 1) risk-taking propensity (19.38%), 2) determined (17%), and 3) tolerance for ambiguity (15%).

Interesting patterns are noted when entrepreneurial attitudes are cross-tabulated with communities' status of the organization. As shown in Table 3, the top three entrepreneurial attitudes ranked first by household participants in organized communities are risk-taking propensity (29%), tolerance for ambiguity (17%), and creativity (13.8%). For those in unorganized communities, the top three entrepreneurial attitudes that they ranked first are risk-taking propensity (21%) and tolerance for ambiguity (21%), determination (14%), and self-confidence (11%), and need for achievement (11%). This reveals that regardless of whether their communities are organized or unorganized, they considered risk-taking propensity and tolerance for ambiguity as to the most important entrepreneurial attitudes.

To test whether there is a significant difference in the proportion of the most important entrepreneurial attitudes between household participants who live in organized or unorganized communities, a chi-square test of homogeneity was used. As indicated by the p-value of .533 and a degree of freedom of 8, there is no significant difference in the proportion, which means that the state of community organization has no bearing on the entrepreneurial attitude of households in the coastal barangays of Bago City and Pulupandan.

Table 4 Chi-Square test to determine whether there is a significant difference in the proportion in the most important entrepreneurial attitude between organized and unorganized organizations.

	Value	df	Asymptotic Significance (2-Sided)
Person Chi-Square	7.030 ^a	8	.533
Likelihood Ratio	6.996	8	.537
Linear-by-Linear Association	.163	1	.686
N of Valid Cases	400		

3 cells (16.7%) have an expected count of less than 5. The minimum expected count is 2.94

Household participants were asked whether they would be ready to start a new business if given the chance, interestingly the majority 95% of them answered affirmatively. When asked what supports they need to start a new business, a majority (95%) of them cited financial capitalization. Other supports they

Table 5 Alternative livelihood/training recommended by fisherfolk organizations

Alternative Livelihood/ Training Identified	PULUPANDAN					BAGO CITY		Total	Rank	
	Zone 1	Zone 1 A	Zone 6	Tapong	Cavan	Canjusa	Sampinit			Poblacion
Massage/Spa Massage/ Hilot	√	√	√	√		√	√	√	7	2
Call Center	√	√		√			√		4	4
Fish processing e.g. deboning, dried fish, smoked fish, sardines	√	√	√	√	√	√	√	√	8	1
Welding	√					√	√		3	5
Organic Agriculture	√	√		√					3	5
Cookery	√					√	√	√	4	4
Training on Business	√								1	7
BK and Accounting	√								1	7
Bread and Pastry		√	√	√		√			4	4
Handicrafts: shell craft/pandan weaving	√	√	√	√			√		5	3
Livestock and poultry raising		√		√					2	6
Project Proposal Making		√			√				2	6
Meat/ Frozen Food Processing		√			√				2	6
Dress Making, smocking			√					√	2	6
Carpentry Training			√			√			2	6
Electrical Training			√						1	7
Internet/ Home Base Business			√						1	7
Gansilyo								√	1	7
Manicure and Pedicure								√	1	7
Haircut								√	1	7

need are fishing implements (9%), products/ stocks such as groceries (5%), and training (2%).

Conservation-based Alternative Livelihood

Livelihood planning workshops were conducted in fisherfolk communities and participated by leaders of partner-fisherfolk organizations. The purpose is to identify a doable alternative livelihood project that organizations can realistically implement given their time and resources. Table 5 shows the alternative livelihood and training suggested by the partner fisherfolk organizations. Based on ranking, fish processing emerged as the number one recommended alternative livelihood as it is recommended by all organizations. Ranked second is the TESDA training on massage therapy as it is endorsed by 7 organizations. Ranked third is handicraft works such as “pandan” weaving and shell crafts. Ranked fourth are training

on TESDA training on cookery, bread and pastry, and call center.

However, in consonance to the purpose of establishing a marine protected area or MPA, proposed livelihoods must not be related inasmuch to fishing in order not only to lessen the dependency of the fisher folks to fishing but also to provide them with alternative sources of income during off-fishing seasons. Thus, among the top three livelihoods recommended by the partner-fisher folk organizations in Bago City and Pulupandan, handicrafts such as shell crafts and “pandan” weaving were considered as the most viable alternative livelihood.

For partner-fisher folk organizations in Bago City, the handicraft training recommended for them was on shell crafts making. There is an abundance of shells, particularly “batad” in the coastal areas of

Barangay Sampinit and this small shell can be used for a variety of decorative purposes. "Pandán" weaving is the alternative livelihood proposed for partner-fisher folk organizations in Pulupandan. It is not only because of the abundance of "pandan" in the locality but also because of the existence of many "pandan" weavers, mostly women who have been engaged in such livelihood for more than three decades.

The study considered also smoked fish and salted egg making as other possible alternative livelihoods. However, in the case of smoked fish making, it can be tapped as a livelihood for fisher folks to make use of the abundant supply of certain seasonal fishes such as sardines. Alternative livelihoods related to eco-tourism and environments must be strongly encouraged.

Discussion

This paper discusses the importance of conservation-based alternative livelihood not only as a poverty reduction measure but as a necessary strategy towards the sustainability of the marine protected area for Irrawaddy dolphins in the coastal waters of Bago City and Pulupandan. It also hopes to contribute to literature as there is a dearth of studies on the effectiveness of marine alternative livelihood projects (Roe et. al (2015) & Cinner (2014) as cited in Lowe et. al (2019). Despite questions on the effectiveness of marine alternative livelihood projects, they are still considered as a key strategy in marine conservation (Roe et. al (2015) & Wright et. al (2015) as cited in Lowe et.al (2019).

The conservation and protection of the habitats of the critically endangered Irrawaddy dolphins can only be realized if marine protected areas (MPAs) are established in the coastal waters of Bago City and Pulupandan. The establishment of MPAs can ensure the protection of habitats, ecosystem structure, functioning and integrity, and species diversity, richness, size, and density (Lester et. al (2009) & Aswserve ani Bennetta et. al (2007) as cited in Bennetta et. al, 2019). It can also benefit local communities through spillover of fish into local fisheries, mitigation of climatic and environmental threats, and tourism livelihood (Bennetta et. al, 2019).

Coastal communities in Bago City and Pulupandan as major stakeholders and resource users have a direct impact on the conservation of habitats of Irrawaddy dolphins and they will be directly impacted also by the establishment of marine protected areas in their coastal

waters. Other than the local government units and other stakeholders, their participation is crucial in the success of MPAs. However, the unabated state of their poverty which worsens during the off-fishing season, and the possible initial economic dislocation that may happen to them as a consequence of strict MPA regulations on their fishing grounds are challenges that the two local government units and other stakeholders need to contend with at the initial phase of MPA establishment. This purports the value of this study on conservation-based alternative livelihood for small fisherfolks.

Alternative livelihood projects have been used as a strategy to address threats on species and habitats from local resource users but conservation and development practitioners have expressed concern that this approach may be flawed (Roe et al., 2015). The International Union of Conservation of Nature (IUCN) in 2012 issued a resolution that called for a critical review of alternative livelihood projects based on concern that their effectiveness is unproven. Alternative livelihoods are often introduced without a thorough understanding of the drivers of unsustainable resource use so their introduction does nothing to improve sustainability (Fauna and Flora International, 2013). In determining an alternative livelihood program, Wright et al. (2016) suggested that rather than using livelihood-focused interventions, it is better to focus on either enhancing the existing livelihood strategies of the fisher folks or livelihoods that have a clear link to conservation and promote good community relations.

Cognizant of the aforesaid discourse on alternative livelihood and its sustainability, this study anchored the alternative livelihoods for fisherfolk communities based on the conservation and MPA management plans of Bago City and Pulupandan. Conservation-based alternative livelihood as defined in this study refers to the strategy of designing livelihood interventions based on the needs and aspirations of marginalized communities, empowering them to support conservation initiatives, adapt to the challenges of climate change, and create mechanisms of supports from various conservation stakeholders. This concept of conservation-based alternative livelihood is attuned to the ecosystem-based adaptation (EbA) which has become the preferred adaptation approach to climate change in the least developed and developing countries (Nalau, et al., 2017). As defined by the Convention on Biodiversity in 2009, ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people adapt to the

adverse effects of climate change. EbA in coastal areas should build on the existing sustainable management practices, institutions, and traditional knowledge of local people, including the ability to predict disasters (Mallapaty 2012 as cited by Swiderska, et al., 2018). However, EbA as an approach has not given much importance to issues of empowerment and agency, and incorporating an empowerment lens could increase consideration of issues of power more broadly, especially the way marginalized groups' agency, access, and aspirations are conditioned by social structures that may prevent strategic adaptation choices (Woroniccki et al., 2019). Conservation-based alternative livelihood as a strategy recognizes the importance of empowering communities not only to address their needs but also to be more active in engaging other stakeholders toward conservation.

Based on the assessment on entrepreneurial skills and behavior, household participants assessed themselves to have very good entrepreneurial skills particularly in terms of confidence in running a new business, accepting responsibilities, and working and communicating with other people. Consistently on entrepreneurial attitude, they identified risk-taking, determination, and tolerance to ambiguity as attributes of a successful entrepreneur that they already possessed. These findings reveal that fisherfolk households in Bago City and Pulupandan have entrepreneurial skills and attitudes which can be leverage if they will be given an alternative livelihood. This explains why an overwhelming majority of them affirmatively replied when asked if they are ready to start a new business if given the chance and what they need is start-up capital. What is significant also is the willingness of the majority of them to participate in programs and activities related to environmental protection and conservation especially related to Irrawaddy dolphins.

Among the top three livelihoods recommended by the partner-fisher folk organizations, handicrafts such as shell crafts and "*pandan*" weaving were considered as the most viable alternative livelihood. The study considered also smoked fish and salted egg making as another possible alternative livelihood. However, in the case of smoked fish making, it can be tapped as a livelihood for fisher folks to make use of the abundant supply of certain seasonal fishes such as sardines. Alternative livelihoods related to eco-tourism and mangrove reforestation must be encouraged.

Alternative livelihoods for fisher folk-households

need to be related to environmental protection and conservation and take into account their skills and resources and readiness and these are managed by fisherfolk organizations. Alternative livelihood that involves the use of fisheries shall be considered only if the resources are abundantly available such as seasonal fishes.

Building and strengthening of fisherfolk organizations in the coastal communities of Bago City and Pulupandan need to be sustained and supported by their local government units and other stakeholders and they need to be actively involved in the protection and conservation of their coastal areas against illegal fishing and related activities and development projects that could destroy their coastal marine resources and the habitats of Irrawaddy dolphins.

Conclusions and Recommendations

The coastal waters of Bago City and Pulupandan are habitats of critically endangered Irrawaddy dolphins and they have been the subject of protection and conservation initiatives of various groups in the past years. But the coastal communities located along the shorelines that continue to rely on fishing as the major source of income and their anthropogenic activities pose serious threats to ongoing conservation efforts especially on the enhancement of marine protected areas (MPAs) for Irrawaddy dolphins. The unabated state of their poverty which worsens during the off-fishing season and the possible initial economic dislocation that may happen to them as a consequence of strict MPA regulations on their fishing grounds are challenges that the two local government units and other stakeholders need to contend with at the initial phase of MPA establishment.

Fisherfolk households in Bago City and Pulupandan have the propensity to engage in conservation-based alternative livelihoods. Based on the assessment, they possess good entrepreneurial skills particularly in terms of confidence in running a new business and accepting responsibilities, and entrepreneurial attitudes such as risk-taking, determination, and tolerance to ambiguity. They expressed willingness to venture into conservation-based alternative livelihoods if given the support and capitalization such as shell crafts making and "*pandan*" weaving especially for women. Though they are mostly not aware of what a marine protected area is and its existence in their coastal waters, they are

supportive of any activity related to the conservation of their coastal waters particularly the MPA for Irrawaddy dolphins.

There is a need to link alternative livelihoods for fisherfolks to environmental protection and conservation taking into account their skills, resources, and readiness and these must be managed by fisherfolk organizations. Alternative livelihood that involves the use of fisheries shall be considered only if the resources are abundantly available such as seasonal fishes. Local government units of Bago City and Pulupandan need to provide alternative livelihood assistance for small fisherfolks in their respective coastal communities and encourage their organizations to submit project proposals for their alternative livelihoods. Collaboration between LGUs, academes, civil society, people's organizations, and communities in the conservation of the habitats of Irrawaddy dolphins in the coastal waters of Bago City and Pulupandan needs to be strengthened.

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