KNOWLEDGE, ATTITUDE, AND PRACTICES OF STAKEHOLDERS IN TUMALINTINAN POINT MARINE PROTECTED SANCTUARY

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Abstract
The study was conducted to determine the Knowledge and Attitude of the stakeholders of Tumalintinan Point, San Lorenzo. It aimed to (1) To determine the profile of the stakeholders of the marine protected sanctuary; (2) evaluate the prevailing knowledge, attitude, and practices of stakeholders relative to the specific coastal and marine ecosystem. Whereas most of the respondents were knowledgeable that coral reef and seagrass affects fish productivity, whereas the mangrove forests and mudflats affect the source of food of various wildlife species. Additionally, they are also knowledgeable about ocean/marine pollution, climate change, biodiversity, and people's contribution to climate change. The result of the survey indicates that respondents living in the specific MPA vicinity were knowledgeable on the different environmental and resource issues. The respondents who participated in the survey have a positive attitude outlook towards their support on marine protected areas established in their locality or area of residency. On the practices on the marine protected area, respondents merely use tin cans, plastic straws, plastic bottles, and other plastic materials, directly harvesting fish for family sustenance, joining tree planting, and taking photos of natural scenery. Furthermore, they never throw garbage anywhere, but some of them are involved in cutting mangroves for charcoal production.

Key words: Marine protection, Coastal ecosystems, Stakeholder's surveying

Introduction

Coastal and marine ecosystems are some of the most prolific ecosystems. However, it is also one of those that are threatened. These ecosystems include open ocean marine areas, nearshore coastal areas, where freshwater and saltwater mix, and certain terrestrial ecosystems such as sand dunes. Most of the world's population lives in coastal areas that are dependent on the various ecosystem services that marine and coastal ecosystems such as coral reefs, mangroves, and seagrass beds provide (UNEP, 2015). The coastal ecosystems are completing the life cycles of a wide variety of commercially and ecologically important marine life that supports the livelihood of nearly 60% of Filipinos (DENR, 2016b). Given the importance of coastal and marine resources, a coastal and marine ecosystems management program (CMEMP) was developed.

The Coastal and Marine Ecosystems Management Program (CMEMP) is a national program aiming to "comprehensively manage, address and effectively reduce the drivers and threats and degradation of the coastal and marine ecosystem" (DENR, 2016a).in order to effectively establish Marine Protected Areas (MPAs), this CMEMP was implemented together with the local government units and the community. (Wahle, Lyons, Barba, Bunce, & Fricke, 2003).

In 1999, the Municipality of San Lorenzo declared the Tumalintinan Point waters as a Fish Sanctuary by the Municipal Ordinance No. 99-005 Series of 1999, for the purpose of conservation, protection, and preservation of the existing natural flora and fauna in the area. Section 1 of the ordinance states that a restricted zone – a body of marine waters surrounding the Tumalintinan Point, geographically located at North Western Coast of Guimaras Strait with latitude from 10º36'43" to 10º37'48" and at longitude from 122º43'28" to 122º44'18" northwest of Guimaras Strait - shall be "off-limit" or prohibited to fishing operations and/or exploitation/utilization of marine species. Section 2 of the same Ordinance also states that the fish sanctuary shall encompass the body of marine waters surrounding the Tumalintinan Point with a total area of 363.72 hectares (core zone – 60.23 has, buffer zone – 303.49 has.).

Although the Tumalintinan Point waters were declared as a fish sanctuary by the relevant Municipal Ordinance, it has not been managed well because the Tumalintinan Point Marine Protected Area Management Plan has not been formulated. Also, the relevant ordinance states to designate a core zone, that is, "No-Take Zone", in the Tumalintinan Point area; however, it does not mention any buffer zone, that is, multi-use zone, which is also very important to protect and conserve the core zone.

Baseline information is necessary as this will be the basis for evaluating the impacts of the program in the community, and this can be done through the Knowledge, Attitudes, and Practices (KAP) Survey. Hence, KAP Survey was carried out in these MPA sites at Guimaras Island.

Objectives of the Study

This study was conducted to determine the Knowledge and Attitude of the Tumalintinan Point Marine Protected Sanctuary of San Lorenzo, Guimaras, Philippines.

Specifically, it aimed to:

1. To determine the profile of the stakeholders of the marine protected sanctuary;
2. To evaluate the prevailing knowledge, attitude, and practices of stakeholders relative to the specific coastal and marine ecosystem.

Material and methods

Research Design

The research design of the study was descriptively utilizing the survey method of data gathering. This was the most appropriate design to be used because the study aimed to determine the Knowledge and Attitude of the stakeholders relative to the implementation of MPA's in Tumalintinan Point, San Lorenzo, Guimaras.

Analysis of the Data

The analysis of the data was processed using SPSS. The statistical tools used were frequency, percent, and ranking.

Results and Discussion

Profile of the Respondents

There were one hundred thirty-one (131) respondents. Respondents were classified as to their cluster, age, sex /gender, number of years residing in the area, religion, and civil status. For the cluster majority of the respondents were from the student's cluster (age 15 and above) several numbers of 86 (65.6%), and was followed by 27 (20.6%) from the cluster of wives of the fishermen and farmers. The rest were local chief executives, heads of households and local organizations, local business owners, and school heads/teachers. It implicates that the stakeholders are comprised of a bigger percentage of student clusters. As to the age, 45.8% were from the age ranging 15-19 and was followed by respondents aged 20-24, since the majority of them were students.

Respondents have 75 (57.3%) females, 55 (42%) males, and only one gay in a total of 131. It implies more women participating and the majority of them stayed in the area for 15, 16, and 17 years with a percentage of 17.6%, 9.9%, and 8.4% respectively. For the religion, a higher percentage of the respondents were Roman Catholic, Baptist, and Born Again Christian with a percentage of 56.5%, 17.6%, and 13.7%, respectively. Most of them are single, with 67.2%.

On the data on the number of family members, highest educational attainment, and organization affiliation. About the number of members of the family, many of the respondents have four members or 25.2%, while those having five members were 20.6 % and six members were 19.1%. This means that the composition of family members among the MPA families in Tumalintinan Point can be categorized as big, which ranges from 4 to 6 members in a family.

In terms of highest educational attainment, most of them were high school level (62 or 47.3 %), followed by those who graduated high school (26 or 19.8 %), college graduate (14 or 10.7%), college-level (13 or 9.9%) and the rest have attained elementary and vocational education.

For their organizational affiliation, 89 or 67.9 % were not a member of any organization, and 10 or 7.6% only were 4P's members, since the majority of the respondents were students and they are not yet inclined to have membership in community organizations.

Other Sources of Livelihood

The majority of the respondents considered agriculture (42.7%) as another source of livelihood; some are involved in piggery (25.2%), poultry (12.2%), carpentry (3.1%), and others (21.4%).

A. Knowledge on Marine Protected Area (MPA)

Biodiversity

It was found out that of the 123 respondents, 94.0% said yes, they know what biodiversity, while only 6 or 5 % answered no, they don't know about biodiversity, and 2 or 1%, were not aware. This simply shows that the educational campaigns of the different organizations, especially by the Provincial

environmental office in the Province, have already paid off relative to the responses made by the respondents on their level of knowledge on biodiversity.
Respondents who know about biodiversity identified what composes diverse bio areas; 93.9% answered animals and microorganisms, 89.3% for trees/plants/forests, 86.3% answered estuaries/coastal areas, rivers/lakes/streams, 46.6% of the responses, and caves with 24.4%. Multiple responses among respondents were made.

Ecosystems
On the item which queried on what are the roles of the coastal and marine and other ecosystems in the area, the respondents replied that the most important role of coastal marine and other ecosystems is as "habitat of various species" (127 or 96.9%), this was closely followed response as "provide food, livelihood and medical benefits to the people" (115 or 87.8%), "protect us from extreme/destructive effects of storm surges, waves, and currents" (110 or 84%). It could also provide recreational, physical, and mental benefits, tourism activities, spiritual activities (96 or 73.3 %), and economic and environmental benefits (91 or 69.5%).
Coastal, marine, and other ecosystems are interconnected (58 or 44.3%) was also one of the roles of the marine ecosystem. What can be gleaned from these responses was that the respondents have high knowledge of the importance of these coastal and marine ecosystems, which surround them either in their personal lives or in the protection and preservation of life. However, they less believed that the interconnection on coastal, marine, and other ecosystems were among the roles of the coastal marine ecosystem.
Respondents identified different ecosystems in the area, wherein almost all of them identified mangrove forests (129 or 98.5%), followed by coral reefs (125 or 95.4%), seagrass beds (122 or 93.1%). Meanwhile, the least of the respondents consider mudflat areas (106 or 80.9%), rivers (66 or 50.4%), salt marshes (59 or 45%), lakes (30 or 22.9%), and lowland forest (17 or 13%) being part of the marine ecosystem. It can be gathered from these answers that the respondents are only aware of the marine ecosystem, which they are so familiar with, and they are not so familiar with other ecosystems considering that their immediate surroundings are within a marine ecosystem.

Mudflats
When the characteristics of mudflats were evaluated, the respondents have varied responses. The majority of them (114 or 87%) described mudflats as muds are deposited by tides or rivers. Flooded due to change of tide level (55 or 42%) was another characteristic according to their answers, and were found in areas where tidal waters flow slowly (48 or 36.6%). For The Importance, 109 or 83.2% said that mudflat is important because it served as nursery areas for some fishes, 108 or 82.4% stated that it provides feeding and resting areas for water birds and is rich in nutrients supporting a diversity of species by 53 or 40.5%.
Mudflats can be affected by some influencing factors, and as identified by the respondents, weather (87%), location of mudflats (48.1%), and tree-planting (19.8%) may affect mudflats. Respondents were also asked if the mudflats may affect the source of food of various wildlife species; 109 or 83.2% said YES, 8 or 6.1% said NO, and there were 4 or 3.1% unaware about how mudflat may affect food for various species.

Mangrove Forests
Results showed that 113 or 86.3% of the respondents believed that mangrove forests are composed of trees and shrubs in salty coastal areas, as well as it has prop roots, thick and waxy leaves 88 or 67.2%), and having a soft substrate (86 or 65.6%).
Almost all of the respondents also appreciated mangrove forests as a natural breakwater (128 or 97.7%), providing refuge to organisms (118 or 90.1%), and source of food to many organisms (112 or 85.5%). Some factors/activities that affect mangroves were illegal logging with 121 or 92.4%, followed by charcoal making with 104 or 79.4. Furthermore, close to half said that mangroves are affected by fishing grounds with 65 or 49.6% responses. These assessments of the respondents about mangroves showed that they have enough knowledge and understanding of the characteristics, importance, and factors/activities that affect mangrove forests. Their observations speak truly of the present conditions of the mangroves in their area because they observed these situations every day.
Respondents were also asked if they are aware that the condition of mangrove forests may affect the source of food of various species like mollusks, crustaceans, and fish. All of the respondents (131 or 100%) responded that the condition of mangrove forests might affect the food of various species.

Seagrass

Results showed that in terms of the important seagrass characteristics, the majority of the respondents believed that the seagrass beds entirely immerse in seawater (129 or 98.5%), grow in marine and brackish water (65 or 49.6%), responses, but few (57 or 43.5%) said that depth distribution is limited by the availability of light. These results only showed that some of the fisher folks do not have enough knowledge and understanding of the distribution and habitat of seagrasses. According to Reynolds (2017), the depth of seagrass location is dependent upon the availability of sunlight.

About the importance of the seagrasses, 121 or 92.4% of the respondents acknowledged that seagrass beds are an important nursery ground for fish and other invertebrates, 116 or 88.5% respondents appreciated that seagrass beds are important for maintaining biodiversity because they provide shelter, while and food for marine animals and 95 or 72.5% replied in affirmative that seagrass stabilizes coastlines and absorb nutrients from runoff. Furthermore, one of the major factors that affect seagrass beds is accidents resulting in oil spills with 124 or 94.7% affirmative response, 88 or 67.2 responses for boat docking, and tree planting 66 or 50.4%.

When the respondents were asked if the condition of our seagrass beds directly affects fish productivity, 126 or 96.2% responded YES, one or .8% said NO, and there were 4 or 3 % were not aware of the effect. This means that almost all of the respondents knew that the condition of the seagrass beds might affect the fish productivity in the area.

Coral Reefs

The 130 or 99.2% out of 131 respondents have agreed that coral reefs affect fish productivity. This implies that the knowledge of the respondents on the role of coral reefs in fish production is high. Furthermore, data shows the important characteristics and factors that affect coral reefs. Results revealed that 112 or 93.3% of the respondents agreed that coral reefs are made of either soft or hard organisms; it was also live, bleached, or dead with algae (69 or 57.5%), and extensive or patchy (54 or 45.0%). Despite the high percentage of the respondents who have agreed on the identified characteristics of the coral reefs yet many of them did not agree on these pre-set notions of the coral reefs characteristics.

About the importance of coral reefs, 128 or 97.7% of the respondents agreed that indeed coral reefs are habitat for fish, that it can help in reducing strong wave action (117 or 89.3%) and can be a source of recreation for people, especially those who are fond of scuba diving (93 or 71.0%). Factors or activities affecting coral reefs were dynamite fishing (126 or 96.2%), global warming (99 or 75.6%), and poaching (86 or 65.6%).

Ocean and Marine Pollution

The majority of the respondents answered YES; they know about the ocean and marine pollution (129 or 98.5%), one or .8% said NO, and the same percentage responded that they are not aware. This means that people living near the Tumalintinan Point were fully aware of ocean and marine pollution. Furthermore, respondents responded that people directly contribute to ocean/marine pollution (125 or 95.4%), few said NO (4 or 3.1%), and 2 or 1.5% said they are not aware. The identified sources of ocean/marine pollution were plastics (117 or 89.3%), the noise produced by supertankers, other large vessels, and machinery (115 or 87.8%),(110 or 84.0%) are saying ballast water, runoff from sewage, deforestation, farming, and other land use (106 or 80.9%), pathogens from sewage and livestock (76 or 58.0%), oil from cars, heavy machinery, and industry other land-based sources (72 or 55.0%), and sedimentation due to erosion from mining, farming and coastal dredging and toxins (47 or 35.9%). According to the respondents, the most contributory factor to ocean/marine pollution is improper waste disposal, especially plastics.

Climate Change

In terms of the knowledge on climate change, out of 131 respondents, 124 or 94.7% know climate change, but still, there's 4 or 3.1% responded NO, and 3 or 2.2% were not aware of climate change. On the idea of people, direct contribution to climate change and its catastrophic effects, 121 or 92.4% responded YES, 9 or 6.8% said that they are not aware, and one or .8% responded NO.

For the knowledge of respondents on climate, respondents claimed that climate change was anchored to shifting of weather patterns (120 or 91.6%), global warming (120 or 91.6%), and caused by humans, use of fossil fuels have extreme weather conditions such as drought and flooding can compromise terrestrial crops and pressure on coastal and marine resources (93 or 71.0%), which releases carbon dioxide and other greenhouse gases into the air (89 or 67.9%). In addition, a minority of the responses were identified that climate change could make coastal areas vulnerable to sea-level rise, warming of the sea/oceans, intensified weather disturbances (69 or 52.7%), low lying coastal

communities being highly vulnerable to sea-level rise (51 or 38.9%), and ocean acidification (28 or 21.4%).

B. Attitude on Marine Protected Area

For the evaluation of the attitude of the respondents, data shows that out of 131 total respondents who participated in Tumalintinan Point marine protected area, wherein the majority of the participating fisher folk feel the need to protect the various ecosystems because it affects their source of livelihood (61.8%), they are always willing to help to protect the various ecosystems by promoting sustainable use of biodiversity resources (56.5%), they will support and participate in local and national government efforts/ programs in protecting our biodiversity (52.7%), they believed every Filipino citizen's obligation and responsibility to protect our country's biodiversity, and I have to find ways to do so starting in my area/community (48.1%), and want to show to my family, relatives, and friends the ways to conserve and protect our biodiversity (45.8%). Meanwhile, they decided to be more conscious of the actions so that they could contribute to increasing resilience against the adverse impacts of climate change (42.7%).

Additionally, they depend on people who are more knowledgeable in protecting our biodiversity because they know better (30.5%); they will blame other people for floods and other calamities that are happening because of their irresponsible actions (16.8%). They will not disregard critical issues about our biodiversity because of lack of knowledge (4.6%) and want to contribute to the country's biodiversity conservation activities because it is not my primary concern (.8%).

The result implies that selected respondents who participated in the survey have a positive attitude outlook towards their support on marine protected areas established in their locality or area of residency. This was a good indication of the participatory approach of the community on the establishment of MPA, but proper implementation and education must be done in order to minimize the negative attitude of the community people when participating and cooperating towards the success of conserving MPA's.

Involvement in DENR and LGU Led Activities

For the past six months, a total of 73 respondents, or 55.7% are involved occasionally in the LGU/DENR activities, 50 or 38.2% were never involved, and only 4 or 3.1% were involved regularly. They were involved in this activity because they considered it as their obligation (35 or 26.7%) to learn updates and new information (17.6%) and only to clarify or ask a question (6.1%).

C. Practices on Marine Protected Area

On the practices on a marine protected area, out of 120 respondents, 28.2% always practice, and 64.1% sometimes practice the use of tin cans, plastic straws, plastic bottles, and other plastic materials, while 5.3% never use. For throwing garbage like tin cans, plastic straws, plastic bottles, and other plastic materials anywhere, 47.3% never practice, and 48.1% sometimes practice throwing garbage anywhere. For directly harvesting fish for family sustenance,8.4 % always practice,36.6 % sometimes practice while also there were 51.9% never practice directly harvesting fish for family sustenance. Almost all (98.5%) of the respondents sometimes practice cutting mangroves for charcoal production, and only 1.5% said that they never cut mangroves. In addition, 22.1% always join tree planting while 45.0% were sometimes joining, and 32.1% have never joined tree planting/clean-up activities. There were 4.6% always, 66.4% sometimes took photos of natural scenery, and 27.5% have never taken. They were also asked if they are calling the attention of local enforcers on illegal activities affecting the environment in the area; 53 or 40.5% never responded, 46 or 35.1% always calling, and for sometimes 32 or 24.4% respectively.

Furthermore, the majority of the respondents (89.3%) said YES that in their homes they are contributing to the conservation and protection of biodiversity by practicing proper waste management, and only 10.7% have responded NO. There were 67.2% who responded YES that they are advocating and participating in activities involving conservation and protection of biodiversity 32.1% said. Respondents were also asked about their home practices that contribute conservation and protection of biodiversity. There were 64 or 48.85% have practiced waste segregation, 28 or 21.37% have compost pit, 6 or 4.58% practiced 3R's and proper waste disposal, 5 or 3.82% for recycling, and the rest have other practices.

Conclusion

Based on the results and findings of the study conducted, the following were plausibly concluded.

(1) On the knowledge of the respondents who participated in the survey, it was significant to note that majority of them were knowledgeable on different areas or issues on MPA and environment. Whereas most of the respondents were knowledgeable that coral reef and seagrass affects fish productivity, wherein the mangrove forests and mudflats affect the source of food of various wildlife species. Additionally, they are also knowledgeable about ocean/marine pollution, climate change, biodiversity, and people's contribution to climate change. The result of the survey indicates that respondents or the fisher folks living in the specific MPA vicinity were knowledgeable on the different environmental and resource issues. This positive awareness or knowledge on those stated concerns can be associated with the information dissemination of concern and accountable having environmental concerns. The respondents who participated in the survey have a positive attitude outlook towards their support on marine protected areas established in their locality or area of residency. This was a good indication of the participatory approach of the community on the establishment of MPA.

(2) On the practices in a marine protected area, respondents merely use tin cans, plastic straws, plastic bottles, and other plastic materials, directly harvesting fish for family sustenance, joining in tree planting, and taking photos of natural scenery. Furthermore, they never throw garbage anywhere, but some of them are involved in cutting mangroves for charcoal production.

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Souhrn

Studie byla provedena s cílem zjistit znalosti a postoje stakeholderů v Tumalintinan Point, San Lorenzo, Guimaras, Filipíny. Mořská rezervace (Marine Sanctuary) byla vyhlášena v roce 1999 za účelem zachování, ochrany a zachování stávající přirozené flóry a fauny v oblasti. Průzkum byl proveden u všech stakeholderů žijících nejblíže chráněné mořské oblasti, (1) s cílem určit profil zúčastněných stran v chráněné mořské rezervaci; 2) vyhodnotit převládající znalosti, přístup a postupy zúčastněných stran ve vztahu ke konkrétnímu pobřežnímu a mořskému ekosystému. Na základě výsledků průzkumu výzkumníci doporučili následující: (a) je třeba provést řádnou implementaci a osvětu, aby se minimalizoval negativní přístup lidí z komunity při participaci a spolupráci na úspěchu

založení rezervace; b) odpovědné orgány musí pokračovat v šíření informací o významu a výhodách rezervace. Pozitivní vnímání rezervace ze strany místní komunity je dobrým kanálem pro vedení komunity k posílení spolupráce s vesničany a vesnickými sdruženími. Jakmile místní lidé rozpoznají přínos a význam ochrany životního prostředí pro budoucnost, program ochrany rezervace může být realizován s minimálním technickým vedením, ale je velmi zapotřebí soustředěného úsilí vědců, akademiků a orgánů společenské odpovědnosti a firem.

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