

Implementing environmental plans and laws at rural grassroots, Palawan, Philippines: status, factors, and moving forward

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ABSTRACT

In the Philippines, the coastal and marine areas in its numerous small islands provide food, minerals, raw materials, and others contribute significantly to the country's GDP. However, its environmental governance at the grassroots level is poorly studied. Hence, this study aims to: monitor and evaluate the implementation of the Area Specific Activity Plan (ASAP) of the identified barangays/municipalities; assess the enforcement of environmental laws, namely: a) solid waste management, b) fishery and c) forestry at the barangays of Palawan; and identify the factors which influence the implementation of environmental plans and laws at the barangay level. This study gathered data among 194 respondents from six municipalities and 59 barangays across Palawan. The result shows that the implementation of the environmental plan of activities of municipalities and barangays ranged from "most of the proposed activities are implemented" to "all of the activities are implemented", indicating a high implementation rate of plans and laws across the barangays of Palawan. There are 15 issues and concerns in the implementation of the ASAP, categorize into five factors: funding, capability, legislative, political will, and IEC. The most common factors are funding, capability, legislative, followed by IEC and political will. Gender equity must be factored-in in plans and strategies.

Keywords: local governance, environmental management, performance evaluation

INTRODUCTION

Good governance is a critical tool for advancing sustainable development (Kardos 2012). The Good Governance in Sustainable Development aims to enhance local implementation actions of the Rio

Resolutions and Agenda 21 for real progress towards sustainable development through 1) empowering the public to enable them to participate in decision making for public interest effectively and to undertake local initiatives; 2) developing and strengthening good governance at the local level; 3) developing the capacity of the public and the government at the local level to cooperate in increasing the welfare of the people (UN 2020). Dewitt (2006) suggested three regulations: "top-down" used by the Federal Government, which has been the backbone of environmental governance in the United States since 1970, however, "bottom-top" grassroots governance and "middle-out" civic environmentalism approaches are also necessary to sustain the environmental protection of the country. Furthermore, Gera (2016) emphasized the institutionalization of public participation in environmental governance in the Philippines, analyzing the shifting demarcations of public engagement and how these define the interplay of institutional-legal structures with the country's political economy constraints.

The main challenges of good governance are lack of participation and engagement, lack of accountability, low transparency, lack of awareness of active citizens, the weak role of civil society, and gender inequality (PIN 2017), while the quality of decision making, accountability processes, directed towards continuous improvement, is also of equal importance (Taylor 2016). Furthermore, to improve efforts, require a grassroots approach by factoring in local attitudes and behaviors in the policies (Cameron 2016).

The grassroots are where direct interactions between people and people, people and the environment, and people and government openly happen. This makes the grassroots a critical functional unit of the society, wherein the effectiveness of the framework and processes of its local governance is imperative for the sustainable development of the country and well-being of the communities. However, the different types of law implementations at grass root levels may cause public policies to fluctuate due to the low level of applicability of policies in the local contexts and changes in pressure from above create social conflicts and governance problems (Chen and Zhang 2016). Currently, the interactions between the people and the environment create growing environmental insecurities, which means not having enough food, water, and natural resources to live in, and can fuel increases in wildlife crime. Thus, understanding the local perception of policies can help predict buy-in for current and future risk-management strategies (Cameron 2016). On the other hand, environmental planning and the implementation of local plans and laws are equally important to support governance in particular and sustainable development in general.

In the Philippines, the coastal and marine areas in its multiple small islands provide food, minerals, raw materials, and others, contributing significantly to the country's GDP (Adan 2010). However, in the past, the

Philippine Local Government Units (LGUs) are largely unaware of their roles in managing municipal waters, as much as they are uninformed about the roles of government institutions task to assist them, while in general, resource management receives low LGU prioritization (Pestaño-Smith et al. 1999).

Consequently, as anthropogenic activities took tolls on once pristine environments of the country, such approaches as the Coastal Resource Management (CRM) in the Philippines have grown (Hansen et al. 2007). Realizing this, the Philippine Government enacted legislation that empowers the LGU with full jurisdiction over the management of their natural resources, known as the Local Government Code of 1991 or Republic Act 7160. This law transfers control and responsibility of delivering basic services to the hands of LGUs. It aims to enhance the provision of services at the grassroots level and sought to widen the decision-making space by encouraging the participation of stakeholders, especially at the local level (Republic of the Philippines 1991). The Philippine government hopes to mitigate and regulate further degradation of its natural environment and promote sustainable development through a bottom-up approach. Hence, it is likewise worth to get information on the performance of RA 7160 at the grassroots level.

One of the goals of the Environmental Justice Reform Program thru the Institute of Environmental Governance (IEG) project funded by the International Technical Assistance Program US Department of the Interior-International Narcotics and Law Enforcement (USDOJ-INL) of the US Department of State is to capacitate the Philippine barangay, municipal, and provincial officials on environmental management and law enforcement for them to be able to carry out their mandated responsibilities under RA 7160: which is to safeguard, conserve and protect the resources from the smallest unit of the government, which is the Barangay LGU, to the Municipal LGU, and at the Provincial LGU.

Within the above program, the NGO Tanggol Kalikasan (TK) partnered with the Western Philippines University (WPU), to create the IEG office to assist in the monitoring of the implementation of the Area Specific Activity Plans (ASAPs) on the ground. Hence, this study generally answers on how the barangays implement the environmental plan and laws and identify the factors influencing the implementation of local plan and law. Thus, this study monitored and evaluated the implementation of ASAP of the identified barangays/municipalities; assessed the enforcement of such environmental laws as a) solid waste management, b) fishery laws, and c) forestry laws at the barangays of Palawan; and identified the factors which influence the implementation of environmental plans and laws at the barangay level.

METHODS

The barangay and municipal officials were trained on Disaster Risk Reduction Management (DRRM), Climate Change, Fisheries Management, and Biodiversity, in June 2018, followed by the formulation of their respective ASAPs, through the auspices of the TK. Copies of plans, proposed projects and activities, and contact directories of lead persons of every barangay/municipalities were obtained from the TK and used as the reference of field contact persons. Survey forms were designed and provided by TK.

Data was gathered through purposive personal interviews, using a Likert Scale (implemented, sometimes implemented, and not implemented) to rate the performance of barangays. The respondents are the municipal and barangay officials, barangay constituents, and members of relevant organizations affiliated with barangays. Activities and projects found in ASAP were visited, photographed on-site, and activity updates were evaluated against the original plans that the municipality/barangay has formulated during workshops, including the time frame of the project. Respondents were interviewed on the implementation of ASAP first, followed by questions on the enforcement of environmental laws and factors that might have affected the implementation of the plans and laws. Free and prior informed consent was solicited from the respondents. They were informed that they might not answer the questions if they so choose not to. Responses were processed and analyzed using descriptive statistics.

Data was gathered in the following municipalities: Busuanga from 12 to 19 January; Magsaysay between 20 and 26 January 2019; Araceli from 28 January to 02 February 2019; from 21 to 24 January 2019 in Brooke's Point; from 25 to 29 January in Sofronio Española; and from 30 January to 01 February 2019, in Narra. This study gathered data among 194 respondents from six municipalities and covered 59 barangays across the province of Palawan.

Interviews were conducted in the following municipalities and barangays: 1) Araceli with 10 Barangays: Dagman, Tinintinan, Osmeña, Taloto, Poblacion, Mairinguen, Madoldolon, Santo Niño, Lumacad, and San Jose De Oro; 2) Busuanga with 12 barangays: Sto. Nino, Concepcion, Sagrada, Bogtong, Salvacion, Old Busuanga, San Rafael, New Busuanga, Buluang, New Quezon, Panlaitan, and Maglalambay; 3) Magsaysay with 7 barangays: Lucbuan, Balaguen, Danawan, Igabas, Lacaren, Los Angeles, and Rizal; 4) Narra with 10 barangays: Antipuluan, Aramaywan, Batang-batang, Caguisan, Calategas, Malatgao, Panacan, Panacan 2, Tacras, and Teresa; 5) Sofronio Española with 7 barangays: Abo-abo, Isumbo, Pulot Shore, Labug, Iraray, Panitian, and Punang; and 6) Brooke's Point with 13 barangays: Aribungos, Amas, District

2 - Poblacion, Imulnod, Ipilan, Mainit, Malis, Mambalot, Oring-orong, Pangobilian, Salogon, Samariniana, and Tub-Tub.

RESULTS

Municipality of Araceli

Area Specific Activity Plan. The barangays mostly implement the activities indicated in the ASAP. The community officials wanted to implement the action plan, but the dry season adversely affected the water source of the island. The strong wave actions of the monsoons also affected the recently planted young mangrove trees. Furthermore, there is no mangrove nursery to provide seedlings for planting.

Environmental Laws Implementation. On solid waste management, the construction of Material Recovery Facilities (MRF), and the enactment of the Solid Waste Management (SWM) ordinance, as well as monitoring, are implemented, but the segregated waste is not collected. The barangays always do the composting, but don't implement the SWM Board. The barangays sometimes implement the Information, Education, and Communication (IEC) for SWM.

Regarding the fishery laws implementation, the mangrove planting is always implemented, while mangrove nursery is not implemented. All the barangays have no mangrove nursery. The barangays did not create the bantay-dagat (Baywatch) and did not apprehend the illegal fishers. Respondents claim that these are responsibilities of the municipality. However, they sometimes implement the IEC regarding fishery laws. The creation of the ordinance, as well as monitoring, are always implemented.

On the forestry laws, the barangays always implement the tree planting activities, but they did not implement the tree nursery projects. They did not create the bantay-gubat (Forest-watch) and did not apprehend the illegal loggers. The community believes that these are the responsibilities of the municipal government. There are no agroforestry and advocacy programs.

Municipality of Busuanga

Area Specific Activity Plan. In terms of environmental protection, the activities in the barangays are mainly under SWM: construction of MRFs, composting of biodegradable wastes, and house-to-house collection of segregated waste. Other initiatives are mangrove and tree planting, as well as the enactment of barangay ordinances.

All barangays implement all the SWM activities indicated in their action plans. The three-wheeled vehicle collects the waste, and is also used for other activities of the barangay. Furthermore, the NGOs assist in the implementation of the environmental plans of LGU.

Planning is conducted just before the election of officials. Implementing the plan becomes a challenge to the newly elected officials. The grass fire is a threat to the tree planting, while the prevailing wind surges and livestock are threats to newly planted mangroves.

Environmental Laws Implementation. Regarding the waste management laws, the waste segregation and collection, construction of MRFs, creation of the SWM Board, the passing of SWM ordinance, and monitoring are always implemented, while composting is sometimes implemented. The respondents argue that it is the responsibility of the households to make their composting pits.

Almost all of the activities related to fishery laws are implemented, except for the mangrove nursery. The IEC related to fishery laws is sometimes implemented.

On forestry laws, tree planting activities are always implemented but need tree nurseries. The barangays create the bantay-gubat and always apprehend illegal loggers, while sometimes implement the agroforestry and advocacy programs.

Municipality of Magsaysay

Area Specific Activity Plan. The communities have implemented most or all the activities included in their ASAP. The newly elected barangay officials started their services in July 2018, who were challenged by the limited time to formulate the budget for the activities for the year 2019.

The barangays have submitted SWM Plans to the municipality and created their respective SWM Barangay ordinances. All barangays constructed the Material Recovery Facilities, but due to lack of garbage transport, the barangays don't collect segregated waste materials from households, except MRFs.

The municipality requires barangays to formulate a ten-year SWM plan. The barangays do not collect the waste materials from households, though the municipal LGU already informed them MRFs availability. Hence, barangays don't usually bring recyclable materials to MRFs, including single-use plastics. On the other hand, since there are negative reactions by some fishers to the establishment of MPAs, there is a need for IEC.

Environmental Laws Implementation. For solid waste management, the barangays always implement the waste segregation, construction of MRFs, creation of SWM Board, IEC regarding SWM, the creation of ordinance, and monitoring. However, the waste materials are not composted. The communities insist that the collection of segregated waste and composting are obligations of the municipal government.

In fishery laws, the barangays always implement the mangrove planting, create fishery law ordinance, and do monitoring, but do not implement mangrove nursery. Moreover, they always implement the bantay-dagat and apprehend illegal fishers. Others felt that this is the responsibility of the municipality rather than the barangay. The barangays sometime implement the IEC regarding fishery laws, which is being discussed only during the barangay assembly and no activity proposed.

In the forestry laws, tree planting activities are sometimes implemented, while tree nursery is not implemented. Furthermore, the bantay-gubat and apprehension of illegal loggers are thought by the majority as the responsibility of the municipal government and not the barangay. The barangays do not implement agroforestry and forestry advocacy programs.

Municipality of Narra

Area Specific Activity Plan. In general, the barangays implement the SWM activities indicated in their ASAP. The barangays allocated funds for the construction of MRF. They also strengthened their IEC among the constituents.

There is strict compliance in terms of the implementation of fishery and forestry laws. Problems that hindered the implementation of the ASAP of the barangays are the limited source of funds, and the bad timing of planning *vis a vis* election and budget hearing.

Most of the areas in the barangay strictly implemented the SWM Act of 2001. They constructed MRFs and conducted IEC to inform their constituents on proper waste segregation.

Mangrove reforestation is done in areas where there is illegal cutting, one to two times annually. The barangays conduct tree planting and coastal clean-up. Some barangays anchor their environmental protection programs to the municipal and national laws.

Environmental Laws Implementation. Waste segregation is one of the highlights in the barangays of Narra. The segregated wastes are collected, but no service vehicle is available to transport the waste materials,

hence waste collection is not implemented. The barangays implement composting, but some members have no composting area. The construction of MRF, the creation of the SWM board, IEC for SWM, SWM ordinance, and monitoring are always implemented.

Regarding fishery laws, more than half of the respondents perceive that the barangays implement the mangrove planting while they do not implement the nursery for mangroves. The barangay bantay-dagat is not created, the illegal fishers are not apprehended because the communities believed that these are the responsibilities of the municipality. Meanwhile, they sometimes implement the IEC regarding fishery laws. The creation of the ordinance, as well as monitoring, are always implemented.

On forestry laws, tree planting activities are conducted, but a tree nursery is missing. They do not create the bantay-gubat and don't apprehend illegal loggers, thinking that these are the responsibilities of the municipal government. There is no program regarding agroforestry or reforestation.

Municipality of Sofronio Española

Area Specific Activity Plan. In general, all SWM activities indicated in their ASAP are implemented. The barangays allocate funds for the construction of the MRFs and strengthen the conduct of IEC among the constituents and strictly comply with the fishery and forestry laws.

Problems that hindered the implementation of the barangay ASAP are the limited funds to implement activities and the timing of planning and implementation of the project.

The municipality conducts mangrove and tree planting in its three identified barangays. Community members and barangay staff planted assorted fruit trees as a potential source of income. Some of the environmental protection programs of the barangays are anchored to municipal and national laws.

Environmental Laws Implementation. The SWM laws range from sometimes or not implemented among the barangays of Sofronio Española. They did not implement the waste segregation. The creation of the SWM Board is sometimes implemented. There is no transportation to collect waste materials. Some respondents have no composting area.

The barangays always construct MRF, while IEC for SWM, the creation of SWM ordinance, and monitoring are always implemented.

The mangrove planting is implemented, however the nursery is not implemented. The bantay-dagat is not created, therefore the illegal fishers are not apprehended. Respondents believe that these are the responsibilities of the municipality. Meanwhile, IEC on fishery laws is sometimes implemented. Ordinances are created, while monitoring is always implemented.

Tree planting activities are always implemented, but a tree nursery is missing. The creation of the bantay-gubat and apprehension of illegal loggers are sometimes implemented. Respondents believe that these are the responsibilities of the municipal government. There are no agroforestry and reforestation programs implemented.

Municipality of Brooke's Point

Area Specific Activity Plan. In general, the barangays of Brooke's Point properly plan and implement their environmental projects strictly in accordance with the Republic Act 9003.

Forest rehabilitation activities coordinate with the Department of Environment and Natural Resources through their "Enhanced National Greening Program," which produced not only timbers but also fruit trees with financial returns. The locals and volunteers actively implement forest conservation activities. The implementation of their plan is efficient. The enhanced version of IEC brought awareness to various aspects of SWM, forest protection, and sustained water source to barangays.

The barangays strictly implement the Republic Act 9003. They also conduct tree planting activities in the upland areas of various barangays. Some of the environmental protection programs of the barangay are anchored to municipal and national laws. Mangrove reforestation is conducted twice a year. They also conduct information and education on the proper waste segregation and composting to produce organic fertilizers.

Environmental Laws Implementation. Waste segregation is always implemented in the barangays, but there is no transport vehicle to collect the segregated wastes. They also implement composting, but some respondents have no composting areas. The MRFs are always implemented. They enacted SWM ordinances and always implement the SWM board, SWM monitoring, and IEC for SWM.

The mangrove planting is always implemented, however there is no nursery. The bantay-dagat is not created, and illegal fishers are not apprehended. The community felt that these are the responsibilities of the municipality. Meanwhile, IEC on fishery laws is sometimes implemented. The enactment of ordinances and monitoring are always implemented.

Tree planting activities are always implemented, but there is no nursery. Further, there is no bantay-gubat, therefore illegal loggers are not apprehended. Respondents thought that these are the responsibilities of the municipality. There are no agroforestry programs as well.

Summary of the perception of the implementation of the environmental laws across 59 barangays of Palawan.

The respondents' profile across barangays of Palawan is 56.70% barangay officials and 43.30% barangay constituents, 82.99% of whom are females (Table 1). Eighty-two point ninety-nine percent (82.99%) of the respondents are married. Graduates of secondary school comprised 41.75% of the respondents, while 35.05% have finished college education. Below is the assessment of ASAP and environmental laws implementation in barangays across Palawan.

Table 1. Distribution of the respondents according to socio-demographic data.

Socio-Demographic	Frequency (n=194)	Percentage (%)
Social Status		
Barangay Official	100	56.70
NGO/PO/Association	0	0.00
Ordinary Citizen	84	43.30
Gender		
Male	75	61.34
Female	119	82.99
Civil Status		
Married	161	82.99
Widow	10	5.10
Separated	4	2.06
Single	19	9.79
Education		
Elementary	30	15.46
Secondary	81	41.75
Vocational	15	7.73
College	68	35.05

Waste segregation is always implemented (86.60%) (Table 2). The collection of segregated wastes is sometimes implemented. Composting (52.58%), MRF (87.11%), SWM Board (59.79%), waste management monitoring (89.18%) IEC of SWM, and SWM ordinances are always implemented across barangays of Palawan.

Table 2. Distribution of the respondents according to their perception of solid waste management implementation.

Activities	Frequency (n=194)	Percentage
Waste Segregation		
Not Implemented	7	3.61
Sometimes Implemented	713	6.70
Always Implemented	168	86.60
Segregated Waste Collection		
Not Implemented	71	37.63
Sometimes Implemented	13	6.70
Always Implemented	89	45.88
Decided not to answer	21	10.82
Composting		
Not Implemented	35	18.04
Sometimes Implemented	54	27.84
Always Implemented	102	52.58
Decided not to answer	3	1.55
MRF		
Not Implemented	19	9.79
Sometimes Implemented	6	3.09
Always Implemented	169	87.11
SWMB		
Not Implemented	37	19.07
Sometimes Implemented	0	0.00
Always Implemented	116	59.79
Decided not to answer	41	21.13
Environmental IEC		
Not Implemented	14	7.22
Sometimes Implemented	47	24.23
Always Implemented	130	67.01
Decided not to answer	3	1.55
SWM Ordinance		
Not Implemented	7	3.61
Sometimes Implemented	0	0.00
Always Implemented	174	89.69
Decided not to answer	13	6.70
Monitoring		
Not Implemented	11	5.67
Sometimes Implemented	7	3.61
Always Implemented	173	89.18
Decided not to answer	3	1.55

As for fishery laws (Table 3), mangrove planting projects are always implemented, but mangrove nursery is not implemented. In bantay-dagat and illegal fishing apprehensions, the majority of the respondents decided not to answer. However, 36.60% of bantay-dagat and 32.47% of apprehension answered always implemented. Hence, bantay-dagat and illegal fishing apprehension are sometimes implemented. Fishery law IEC, ordinances, and monitoring are always implemented.

Table 3. Distribution of the respondents according to their perception of fishery laws implementation.

Activities	Frequency (n=194)	Percentage
Mangrove Planting		
Not Implemented	28	14.95
Sometimes Implemented	3	2.06
Always Implemented	121	66.49
Decided not to answer	38	20.10
Mangrove nursery		
Not Implemented	129	66.49
Sometimes Implemented	7	3.61
Always Implemented	8	4.12
Decided not to answer	50	25.77
Bantay dagat		
Not Implemented	45	23.20
Sometimes Implemented	5	2.58
Always Implemented	71	36.60
Decided not to answer	73	37.63
Illegal fishing apprehension		
Not Implemented	36	18.56
Sometimes Implemented	1	.52
Always Implemented	63	32.47
Decided not to answer	94	48.45
Fishery Law IEC		
Not Implemented	7	3.61
Sometimes Implemented	59	30.41
Always Implemented	76	39.17
Decided not to answer	52	26.80
Fishery Law Ordinance		
Not Implemented	26	13.40
Sometimes Implemented	0	0.00
Always Implemented	100	51.55
Decided not to answer	68	35.05
Fishery Law Monitoring		
Not Implemented	15	7.73
Sometimes Implemented	7	3.61
Always Implemented	123	63.40
Decided not to answer	49	25.26

Regarding forestry laws, tree planting projects are always implemented, but tree nursery projects are not implemented. Bantay-gubat, illegal loggers' apprehension and agroforestry projects are not implemented, while advocacy program is sometimes implemented (Table 4).

Table 4. Distribution of the respondents according to their perception of forestry laws implementation.

Activities	Frequency (n=194)	Percentage
Tree Planting		
Not Implemented	38	19.59
Sometimes Implemented	6	9.09
Always Implemented	148	77.27
Decided not to answer	2	1.03
Tree Nursery		
Not Implemented	129	23.20
Sometimes Implemented	6	3.09
Always Implemented	50	25.77
Decided not to answer	9	4.64
Bantay Gubat		
Not Implemented	45	62.12
Sometimes Implemented	5	2.58
Always Implemented	53	27.32
Decided not to answer	91	46.91
The apprehension of Illegal Loggers		
Not Implemented	63	32.47
Sometimes Implemented	14	7.22
Always Implemented	57	29.38
Decided not to answer	60	30.93
Agroforestry Program		
Not Implemented	91	46.91
Sometimes Implemented	22	11.34
Always Implemented	76	39.18
Decided not to answer	5	2.58
Advocacy Program		
Not Implemented	72	37.11
Sometimes Implemented	24	12.37
Always Implemented	91	46.91
Decided not to answer	7	3.61

The plan of activities of municipalities and barangays ranges from "most of the proposed activities are implemented" to "all of the activities are implemented". There are fifteen issues and concerns in the implementation of the ASAP (Table 5), categorized into five factors, funding, capability, legislative, political will, and IEC. The most

common factors are funding, capability, legislative, followed by IEC and political will.

Table 5. Issues encountered in the implementation of ASAP with their corresponding influencing factors and percent number of issues per factor.

Factors	Identified Issues	Total Number of Issues	%
Funding	<ol style="list-style-type: none"> 1. The dependency of barangay funds and logistics on municipal LGUs. 2. No salary for tanods and fish wardens. 3. Lack of logistics to apprehend illegal fishers and collection of waste. 	4	26.7
Capability	<ol style="list-style-type: none"> 1. Insufficient technical knowhow on livestock-related livelihoods (piglets dying, mother pig cannot reproduce). 2. Marine turtles invade seaweed farms. 3. Lack of knowledge on timing for the planting of mangrove seedlings. 4. Occurrences of grass fires. 	4	26.7
Legislative	<ol style="list-style-type: none"> 1. Absence of ordinances in some barangays (e.g., mitigate slash and burn). 2. Legal issues in some land boundaries for tree planting. 3. Sudden changes in barangay officials affect the timing of planning. 4. Grazing of goats and cows on mangrove reforestation. 	4	26.7
Political Will	<ol style="list-style-type: none"> 1. The council does not prioritize some proposed activities in the plan. 	1	6.7
EIEC	<ol style="list-style-type: none"> 1. The communities believe that the collection of segregated waste and composting are the mandates of the municipality. 2. Insufficient IEC interventions for MPAs. 	2	13.3
Total		15	100

DISCUSSION

The participants/LGUs utilized the knowledge that they learned from the workshops. There is a high rate of implementation of environmental plans and laws across the barangays of Palawan. The implementation of the plan of activities of municipalities and barangays ranged from "most of the proposed activities are implemented" to "all of the activities are implemented",

indicating a high implementation rate of plans and environmental laws across the barangays of Palawan.

The barangays always implement the waste segregation and composting, but sometimes collect the waste materials. The barangays always construct the MRFs, create the SWM Boards, enforce ordinances, conduct IEC, and do monitoring. Communities believed that the collection of segregated waste and composting are responsibilities of the municipal government. The bantay-dagat and apprehension of illegal fishers are sometimes implemented. Fishery ordinances, IEC on fishery laws, and monitoring on enforcement of fishery laws are always implemented. Tree/mangrove planting is always implemented, but nursery projects are not implemented. Bantay-gubat and apprehension of illegal loggers are sometimes implemented, along with agroforestry and advocacy programs.

Successful implementation of environmental protection at the ground level are affected by lack of participation and engagement, lack of accountability, low transparency, lack of awareness of active citizen, weak role of civil society, and gender inequality (PIN 2017). Moreover, Taylor (2016) emphasizes that quality of decision making, accountability processes also influence the protection of the environment. Additionally, local attitudes and behaviors (Cameron 2016), and political will, legislation, stakeholder's participation, and priority of outsourced funds (Gonzales 2011) must be considered as critical factors in the protection of the environment.

On the other hand, crucial strategies to mainstream environmental concerns to government units must include: the use of innovative IEC that will install long term effect to stakeholders; set issues into the main agenda of the government; enact legal frameworks and policies; pursue development plans at all levels with the budget for the execution of the plans; execute the plan; set monitoring and evaluation regimes to the program (Gonzales 2012).

Gender equity did not appear as a factor in the implementation of plans and laws, which may mean that Palawan barangays are not sensitive to gender issues. Hence, more efforts should focus on gender and development (GAD) in the surveyed barangays and or other barangays.

Although there are legislative issues (Table 5), the Palawan municipal LGUs, in general, display a common vision of successfully conducting and sustaining Coastal Resource Management programs accompanied by more than just supportive legislation as the Local Government Code of the Philippines (Hansen et al. 2007). However, barangays must also exhibit the necessary technical competence and financial capability as suggested by Riggs (2003), which can resolve the capability issues at the local level (Table 5),

along with political will, which also plays a major role in successful CRM programs (Hansen et al. 2007).

Barangays and municipalities in Palawan have effectively carried out their respective ASAP, which is in contrast to the past observation that LGUs across the country develop their coastal management plans, but are not always used. It seldom forms part of the LGU's development plan, though some LGUs welcome the use of the plan making it an integral part of their development plans with budget allocations (Gonzales 2011). With this premise, there is a need to evaluate the implementation in barangays outside Palawan to discern whether the Philippine grassroots LGU has improved the enforcement of their environmental laws and plans through time. Additionally, monitoring and evaluation should be practiced and institutionalized at the barangay level.

The plans are not immediately integrated or interfaced with the existing development or investment plans of the municipality or city, thus, no budget is allocated (Gonzales 2011). Therefore, ASAP should find means to be included in the Annual Investment Plan (AIP) of the municipality to be funded. Although various funds for projects come from the 20% Development Fund in the AIP of the Internal Revenue Allotment (IRA), other sources of the budget for environmental plans may also come from outside sources. However, funding from external sources may have structured objectives and directions that are inconsistent with, may not suit, or directly respond to the real needs of the beneficiary community (Gonzales 2011).

Another factor in implementing barangay environmental plans and laws is IEC. In the past, the Philippine LGUs are largely unaware of their roles in managing municipal waters, as much as they are uninformed about the roles of government institutions that have been tasked to assist them, while in general, resource management receives low LGU prioritization (Pestaño-Smith et al. 1999). This is also reflected in this study where the communities are unaware of who is responsible for the waste management, the creation of bantay-dagat/bantay-gubat and apprehension of violators. Moreover, many residents don't necessarily see wildlife trafficking as a crime, thus communication and outreach directed specifically to changing locals' attitudes could be one possible tool in solving this disconnect, rather than focusing on the socio-environment dimensions such as access to land to grow food or having a reliable source of clean drinking water (Cameron 2016). Hence, strategic IEC should become one of the enablers for sustainable development at the grassroots level, emphasizing the changing of local attitudes and behavior.

The Local Government Code of the Philippines has enabled the LGU to gain control of the management of their respective natural resources. Still, this study and the findings of Hansen et al. (2007) showed problems

encountered in implementing the Code at the grassroots level. Besides, although the existence of a causal link from governance/institutions to growth performance is widely accepted, this does not suggest that one can systematically rely upon improved ordinance to generate growth over the time horizon that policymakers can care about (a decade or two). Improved governance in a particular dimension would be effecting in generating growth when poor governance in that dimension is among the binding development constraints in the country (Rodrik 2008). Moreover, there should be a strong equity in the national policy and legislation to provide clear guidance on food security and nutrition at grassroots levels. Ground works should also be laid out for good governance, including empowerment and capacitation of grassroots levels (Immink 2011).

The above results and discussion show five factors that influence the implementation of environmental plans and laws at the barangays of Palawan, namely: funding, capability, legislative, political will, and IEC. The most common factors are funding, capability, legislative, followed by IEC, and political will. Gender equity did not appear as a factor; hence, it should be factored-in in the future barangay plans and strategies as recommended by PIN (2017).

The above arguments also emphasize that the national government putting in place the legislative support for environmental protection/CRM through RA 7160 must also provide follow-up laws and programs to augment and support the implementation of environmental protection and management at the grassroots, including but not limited to the above-mentioned implementing factors.

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