Bangkung Mapalad
Sasmuan, Pampanga

Participatory Coastal Resource Assessment (PCRA) of Brgy. Batang Dos, Sasmuan, Pampanga 2017

This participatory coastal resource assessment has been undertaken with a joint collaboration of DENR, BFAR and the Local Government Unit (LGU) of Sasmuan, Pampanga. The report will be used by the LGU to support the establishment of Sasmuan Bangkung Mapalad Critical Habitat and Ecotourism Area (SBMCHEA).

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PARTICIPATORY COASTAL RESOURCE ASSESSMENT (PCRA) OF BRGY. BATANG DOS, SASMUAN, PAMPANGA 2017

I. Introduction

A fourth class municipality, Sasmuan is the only town in the Province of Pampanga engaged economically to fishing and aquaculture and no other agricultural products like livestock, poultry and high value crops. It is located in the midst of fishponds, rivers and streams and purely dependent on its fishery resources as the main source of livelihood of its residents. The fishery industry in Sasmuan is composed of three sectors: the capture fisheries (municipal fisheries); the culture (fishpond operation) and the marketing of fish products (people engaged in selling and trading of different fishery products be it fresh or processed). This employs more than 85% of the total population of the municipality (Local Government Unit of Sasmuan).

In old times, Sasmuan has been endowed with rich natural resources such as mangroves. The people derived their income from the bounties of its vast communal rivers, which are directly connected to Manila Bay. The teeming of schools of fish in nearby rivers was an easy access that the municipal fishery sector contributed a bigger share of its total fish production compared to the aquaculture. This could probably be the reason why fishermen in the municipality have not thought of engaging themselves to other economic activities aside from fishing. The aquaculture sector was left to investors outside the municipality (leasing them to fishpond owners from the town). Although there are few figures from the municipality who made their name out of sugpo farming, it was proven to be a very lucrative business.

Over the years, a significant decline in fish production was observed due to vulnerability of the area to the effect of climate change resulting to massive flooding. Several typhoons have left most of the fishponds unattended, leading to the loss or decrease in fish production.

Moreover, the eruption of Mt. Pinatubo in 1991 brings enormous sand and silts leading to siltation of rivers, hence, dredging activities are currently being undertaken by the

DPWH-Region 3. The Pasak River was one of the ecosystems heavily destroyed by such natural disaster.[1]

The municipality of Sasmuan is located on the southern part of the Province of Pampanga, bounded by the municipalities on the north by Guagua, on the west by Lubao, on the east by Macabebe and on the south by Manila Bay. The municipality has 12 barangays of which by definition of being a coastal area (RA 10654, sec.4.9: a band of dry land and adjacent ocean space (water and submerged land) in which terrestrial processes and uses directly affect oceanic processes and uses, and vice versa; its geographic extent may include areas within the landmark limit of one (1) kilometer from the shoreline at high tide to include mangrove swamps, brackish water ponds, nipa swamps, estuarine rivers, sandy beaches and other areas within a seaward limit of 200 meters isobaths to include coral reefs, algal flats, seagrass beds and other soft-bottom areas), there are two (2) coastal barangays namely Brgy. Mabuanbuan and Brgy. Batang Dos.

Being a coastal community, Sasmuan is considered a wetland because of its unique geographical features. It is located in the midst of fishponds, rivers and streams. This wetland is also thriven with rich faunal and floral diversity comprising of different mangrove species, fishes and other sea creatures. [2]

The *Bangkung Mapalad* formerly Pulung Malapad "*Bangkung Malapad*" is a mangrove islet formed by the volcanic sediments flew and deposited through Pasak River from the Mt. Pinatubo eruption on 1991. The area is surrounded with mudflats that serve as a habitat of various arthropod species. It is a gemstone hidden in the heart of Pasak River gated to Manila Bay. Various personalities from politics, local and international visitors astonished to the majestic view of the mangrove forest enriched with the harmonized bird movement in the sky and mirrored by the calm sea waves. [3]

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[1] Community Resource Assessment and Ground Validation of the Proposed Sasmuan Critical Habitat and Ecotourism Area (2016) - History
[2] Sasmuan Bangkung Malapad Critical Habitat Management Plan (2016) - Introduction
[3] Sasmuan Bangkung Malapad Critical Habitat Management Plan (2016) - Introduction

II. Objectives

The activity aims to:

- Promote coastal resource management (CRM) as a tool to conserve and protect fishery resources for food security and sustain livelihood of marginalized fisherfolk; and

- Determine condition of coastal resources in coastal barangays to cover mangrove and socio-economic condition of the coastal community.

III. Background of the Area

A. Location

Brgy. Batang Dos is bounded on the north by Brgy. Batang 1st at 14°49'50"N and 120°37'20"E, on the west by Brgy. Mabuanbuan at 14°49'50"N and 120°36'00"E, on the west by the Pasak River at 120°37'20"E to 120°37'00"E and on the south by Manila Bay at 120°37'00"E to 120°36'00"E. One of the two (2) coastal barangays facing Manila Bay, Brgy. Batang Dos is located at the southernmost west portion of the municipality. It is one of the 12 barangays of Sasmuan that contribute to fisheries with its fishponds and other fishing activities.

Brgy. Batang Dos is the site of Bangkung Malapad wetland, proposed to be a Critical Habitat and Ecotourism Area because of its rich faunal and floral diversity comprising of different mangrove species, fishes and other sea creatures. It is one of the hotspots in Luzon in terms of bird migration. Through its rich
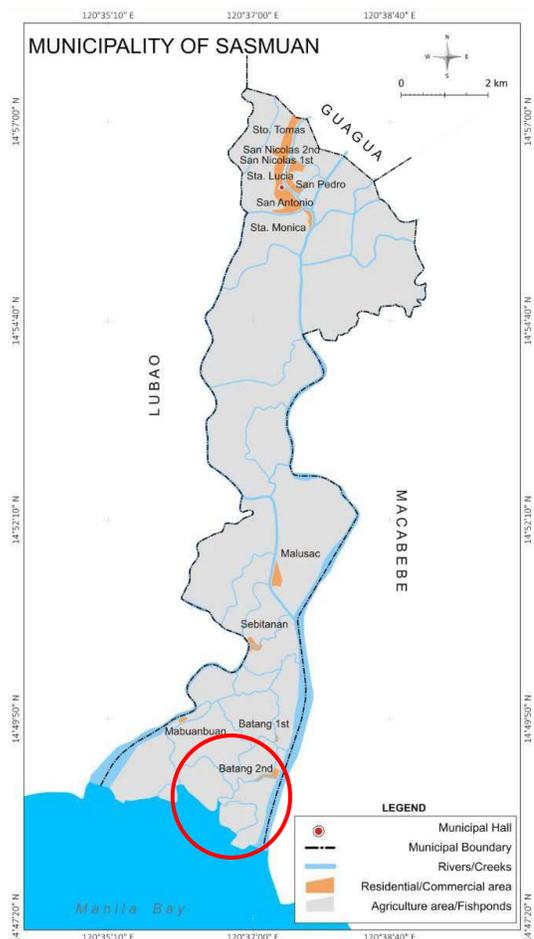

Figure 1. Brgy. Batang Dos is located at the southernmost west of the municipality of Sasmuan, Pampanga.

biodiversity, good climate and an advantageous location, the site became an annual migrating point of migratory birds.

Brgy. Batang Dos could be reached by boat from the town proper with a travel time of about an hour. The nearest highway road is in Macabebe, with its coastal barangay Consuelo, through boat is about 10 minute ride.

V. Methodology

Participatory Coastal Resource Assessment (PCRA) is a process of gathering and analyzing information involving the participation of local resource users. A PCRA in Brgy. Batang Dos, Sasmuan, Pampanga was conducted by a joint collaboration of DENR, BFAR and LGU on May 16-19, 2017. The PCRA covered basic socio-economic profile and comprehensive mangrove assessment of the Bangkung Malapad mangrove forest and a near to the barangay mangrove site.

A.   Socio-Economic Profile

The socio-economic profile was established through the method of interview with the resident of Brgy. Batang Dos, complemented by existing data from the municipal profile. This is a compilation of information that describes the community that uses the coastal resources in the area. Interviewing is a method of gathering secondry data or information by asking questions. The guide questionnaire from Deguit et al. (2004) was used. Most of the questions asked dealt with knowledge, attitudes and perceptions about the marine environment, perceived status of the resources. Socio-economic data like occupation, income, housing condition and household composition were also being asked.

B.   Mangrove

Basic information of the identified mangrove area to be assessed were compiled and discussed during the orientation with the LGU of Sasmuan, Pampanga on April 7, forming then a proposed assessment team. A leveling-off training on mangrove assessment on April 17-18, 2017 was facilitated by DENR for the composite assessment team composed of DENR, BFAR, LGU and fisherfolk representatives. Information compiled includes maps generated by DENR from previous assessment and knowledge of the area by the

barangay residents that frequent the area. The leveling-off training capacitated the members of the assessment team on mangrove species to ensure a standardized identification of the local name of each species prior to field work. The field activity was carefully planned for the efficient use of time, personnel and materials needed. Physical factors of the area was taken into consideration such as day time of low tide; altitude, substrate, wilderness and safety of the identified sites to be assessed; and docking area for boat to be used in transporting and fetching the assessment team. Since the assessment area is an hour away travel from the town proper, preparations such as assessment materials, food and accommodation and proper attire for assessment were secured.

A thorough reconnaissance of the mangrove habitat was carried out in order for the team to evaluate the variability of vegetation, extent, distribution and complexity of the area for assessment. Such intuitive view led the team to a better decision on how the location of the baseline should be laid out and the corresponding length which will be required. Prior to actual assessment, materials to be used were prepared such as transect line (50m), ropes calibrated for every 10 m to establish quadrats, GPS device for determining location, assessment forms and field guide. Proper field clothes were also observed such as wearing of booties and hats.

Two sites have been identified for assessment – one in Bangkung Malapad which composed the bulk of the assessment and one from outside. After conducting the reconnaissance, the team decided to assess 5% of the mangrove forest as the area of investigation, establishing six (6) transects equally distributed on the entire mangrove area. Bangkung Malapad is a mangrove islet that mangrove transects were laid from end to end of the mangrove area going through across the mangrove forest. Series of quadrats measuring 10 m x 10 m along the transect were established with no interval.

Mangrove species inside each 10 m x 10 m quadrat along the transect line were identified, its height measured and estimated, diameter at breast height (DBH) of mangrove trees with defined trunk was also determined. Two readings of its crown diameter were recorded on the prepared field data sheet. Difference of a seedling, sapling and a mature tree were noted, e.g. seedling is up to 1 m height and a trunk size less than 4 centimeter (cm) in diameter, sapling is greater than 1 m height and a trunk size of 4 cm in diameter while a mature tree is greater than 1 m height and a trunk size

greater than 4 cm in diameter. Also noted were the number of seedlings and saplings (regenerations) found inside the 1 m x 1 m quadrats which are established in two corners and middle of each 10 m x 10 m quadrat. Series of 10 m x 10 m quadrats along the transect line were measured until the transect line meets the open sea or end of mangrove area. After the first transect, series of transect lines were established perpendicular to the baseline performing the same data collection and measurements representing the mangrove area were covered/represented. Data gathering for mangrove assessment is illustrated in the next figure.
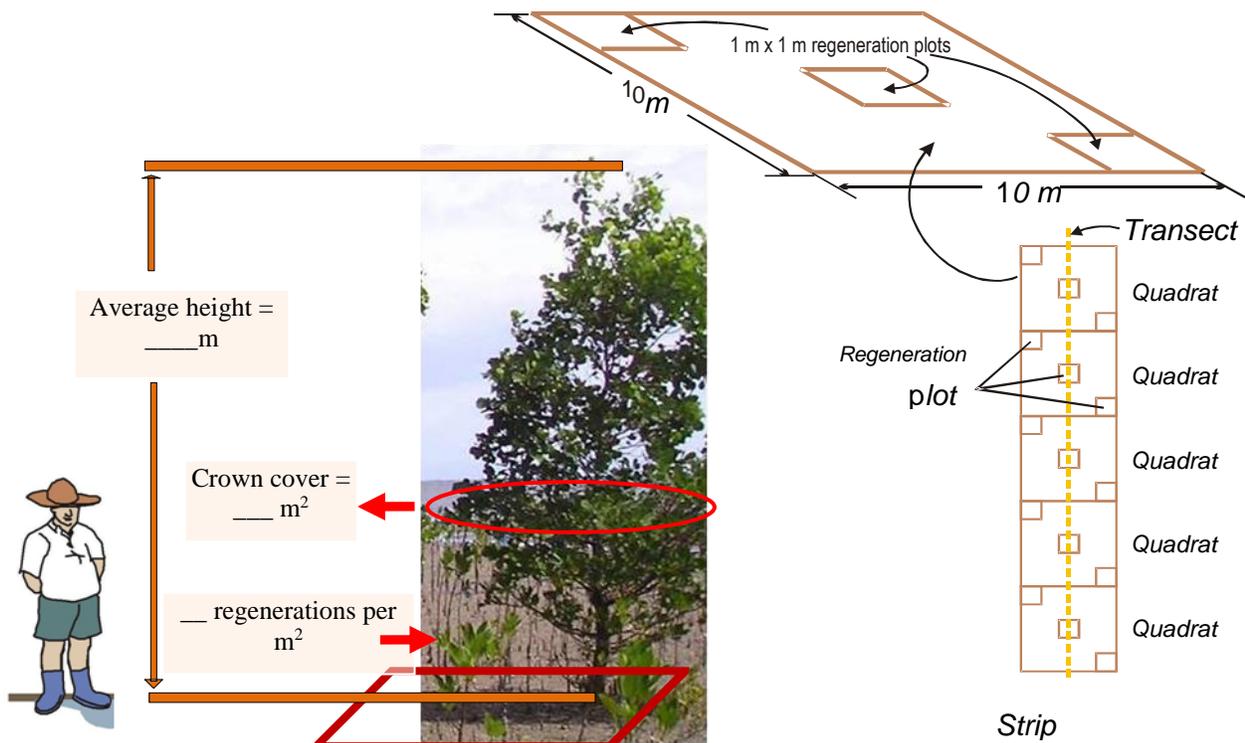
Figure 2. Mangrove assessment establishing quadrat and strip transect (right side); assessment output parameters (left side) (Deguit et al, 2004).

Collected data from the field were transcribed from the data sheet or writing slates into a tabulated form. Data processing and analysis were performed for discussion in the report, using the following formula:

❖ Crown diameter (2 measures) - the average of the crown width at the widest point and a second width measurement made 90º to the diameter at the widest point.

❖ Crown cover is calculated using the formula $\square/4d^2$ or $0.7854d^2$ (d as the total crown diameter)

❖ To get the crown cover for each tree = 0.7854 x (average crown diameter)^2

❖ To get percent crown cover : $\left[\dfrac{\text{Total crown cover of all trees}}{\text{Total area sampled}}\right]$ X 100

❖ To get the average height = Total height of all trees recorded

❖ Total number of trees recorded per transect, then total per site

❖ To get the regeneration per m^2 = $\dfrac{\text{Total regeneration count}}{\text{Total number of regeneration plots}}$

Data per transects were then consolidated to represent sites, then sites summarized to provide an overview condition of the mangrove habitat. The derived parameters were analyzed based on the criteria and condition below:

Table 1. Criteria for Determining Condition of Mangrove.

CONDITION	CRITERIA
Excellent	76% and above in % Crown Cover 1 Regeneration per m^2 Above 5m in average tree height Undisturbed to negligible disturbance
Good	51% – 75% Crown Cover 0.76 – <1 regeneration per m^2 3m – <5m average height of trees Slight disturbance and few cuttings
Fair	26% – 50% Crown Cover 0.50 – 0.75 regeneration per m^2 2m – <3m average height of trees Moderate disturbance and noticeable cuttings
Poor	0 – 25% Crown Cover <0.50 regeneration per m^2 <2m average height of trees Heavy disturbance/ cuttings/ pollution, rampant conversion to other uses, nearly destroyed

The mangrove habitat assessment establishes landward transect stations perpendicular to the shoreline. Using a GPS device to mark location, a transect walk was undertaken to take the landward extent of the mangrove habitat. Mangrove trees were identified as well as other organisms found in the habitat as well. With obtained GPS location coordinates, area is mapped and generated using Google Earth.
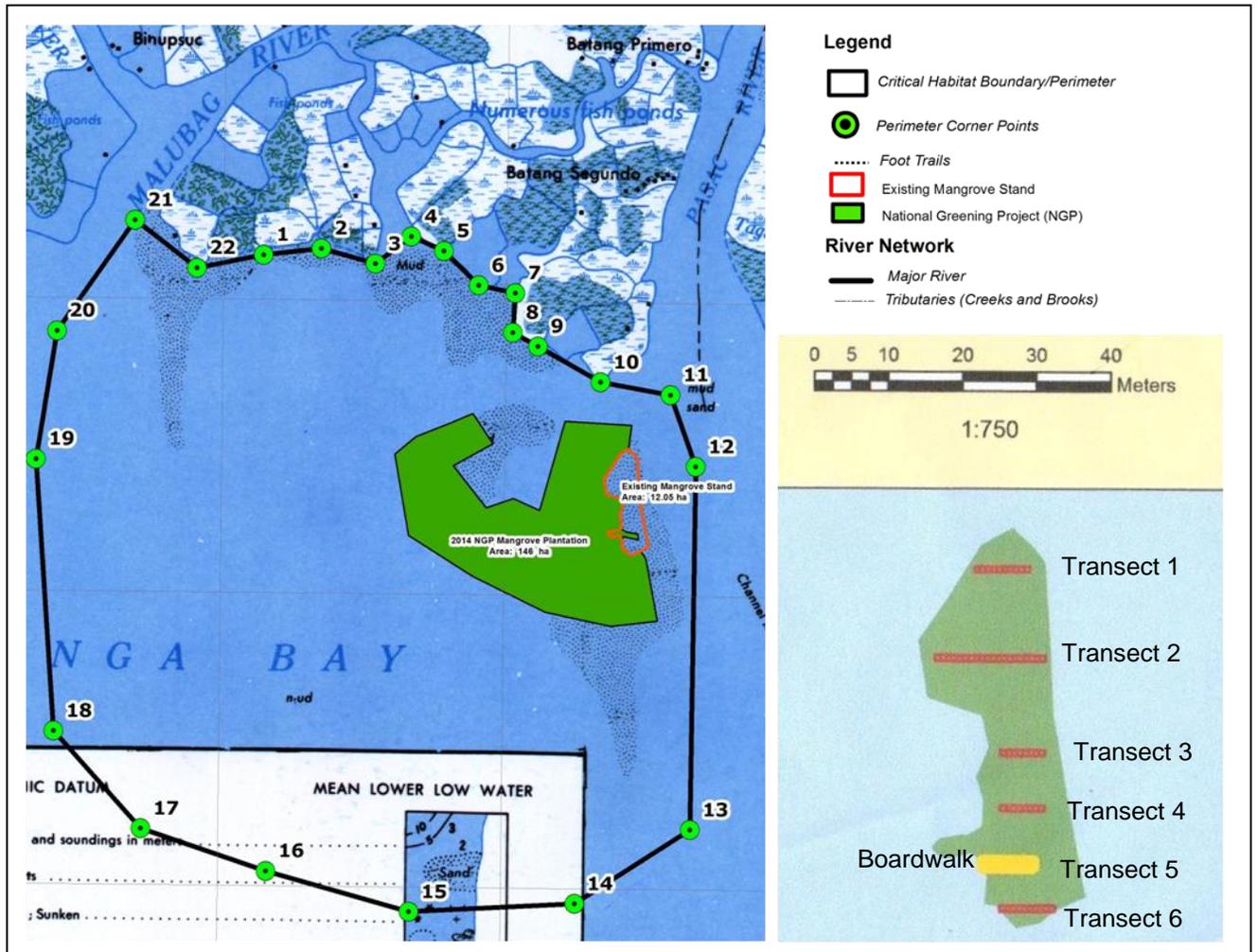
Figure 3. Location of mangrove transects (lower right) within the Bangkung Mapalad, Brgy. Sasmuan, Pampanga. Also shown is the Proposed Sasmuan Bangkung Mapalad Critical Habitat and Ecotourism Area (SBMCHEA) (left).

IV. Results and Discussion

The coastal area of Barangay Batang Dos, Sasmuan, Pampanga socio-economic profile and condition of mangrove area have been hereby presented.

A. Socio-Economic Profile

The socio-economic profile of Barangay Batang Dos, Sasmuan, Pampanga was generated using the interview form, other available references such as the Philippine Statistics Authority for the population, CRM Plan 2013-2016, BFAR Municipal Fisherfolk Registration, etc. This has been summarized, compared with the municipal figures and updated in the next table for handy reference. Note that Brgy. Batang Dos is a significant barangay of Sasmuan because of a proposed Critical Habitat and Ecotourism Area. Brgy. Batang Dos have all other aspects similar to other barangays of Sasmuan and could be differentiated that it is the most distant barangays with reference to Bangkung Malapad. A community resource map as per perception of the community was also generated.

Table 2. Socio-Economic Profile of Brgy. Batang Dos, Sasmuan, Pampanga (2017).

Parameters	Brgy. Batang Dos	Municipal
1. Land Area (ha)	232.2101 ha (6.25%)	3716.1067 ha
2. Household data		
- No. of households	4	6 (5.8)*
- Average no. of children	4	
- Average size of family	8	
- Educational attainment of family members		
• Fathers	High school Graduate	
• Mothers	Elementary Graduate	
• Children	College Level	
- Percent of families who have toilets/ do not have toilets	80%/20%	
- Percent (%) of families engaged in fishing	85%	
3. Demographics		

Parameters	Brgy. Batang Dos	Municipal
- Population (PSA 2015)	1,647 (6.04%)	27,254
- Percentage of community age:		
• Children (0-9 yrs)	35%	
• Youth (10-17 yrs)	20%	
• Adults (18-49 yrs)	40%	
• Elderly (50 yrs & above)	5%	
- Percent of population practice family planning method	50%	
- Most common family planning methods being adopted by couples in the barangay	Birth spacing, pills, injectables	
4. Type of Housing Materials:		
- Type of roof	95% GI sheets 5% nipa/cogon grass	
- Type of walls	80% cement 10% wood/plywood 10% nipa/coconut fronds/bamboo	
5. Source of water	95% dug well 5% jetmamtic pump/ artesian well	
6. Religion	Catholics – 40% Protestants – 20% Iglesia ni Cristo – 0.1% IEMELIF – 20% Born Again – 19.9%	
7. Community Infrastructure	Brgy. Hall, Elementary School, Church (4) Brgy. Health Center Day-Care Center Basketball Court (2) Board Walk & View Deck Waiting Shed (2) Public Cemetery Foot Bridge Fish port Concrete Road Brgy. Slope Protection	
8. Natural Resources		

Parameters	Brgy. Batang Dos	Municipal
- Mud Flats	Present	Present
- Mangroves	Present	Present
- Rivers	Present	Present
9. Livelihood		
- Occupational Structure		
• Capture fisherfolks	90%	
• Professionals (teachers, engineers, accountants)	5%	
• Construction worker	3%	
• Fishpond operators (to include caretakers)	2%	
- Fishermen's estimated income		
• Capture fisherfolks	P 200/day or P 6,000/month	
• Fishpond operators (to include caretakers)	P 50,000/month	
10. Environment-friendly enterprises or livelihood projects	1. Mangrove rehab 2. Fish processing 3. Ecotourism 4. Sari-sari stores	
11. People's Organization (P.O.)	1. BFARMC 2. Concerned citizen of Batang 2nd 3. Women's Group of Batang 2nd 4. Sasmuan Bangkero Association 5. Sasmuan Fishpond Operators Association	
12. Fisheries		
- Aquaculture	1. Fishponds 2. Fish shelter (bumbon) 3. Fish trap (biyakos)	
- Fishpond developments by land area and operators*	230.7950 ha* (6.26%) 35 operators* (6.84%)	3,683.9604 ha* 512 operators*
- Fisherfolk	Total – 103 (4.56%) Male – 97 Female - 6	Total – 2,260 Male – 1,904 (84%) Female – 356 (16%)

Parameters	Brgy. Batang Dos	Municipal
- % Registered Fisherfolk	90%	
- Motorized fishing boat	~ 100	
- Non-motorized fishing boat	~ 50	
- Fishing Gears	- Pante (gillnet/crabnet) - Scoopnet - Crab pot	- Patinga - Biacus - Sacag - Balisasa - Kitig - Pukut - Galadgad
- Common fish caught	1. Ayungin 2. Biya 3. Kanduli 4. Kitang 5. Tilapia 6. Apahap 7. Banak 8. Bakoko 9. Swahe 10. Hipong puti 11. Ulang 12. Alimango 13. Alimasag 14. Alamang 15. Tahong 16. Kapis 17. Talangka 18. Needlefish (red) 19. Dalag 20. Asohos 21. Bidbid 22. Bangus 23. Biko 24. Alupihang Dagat 25. Palos 26. Karpa	
- Coastal activities	- Fishing - Dredging by DPWH - Fish processing by women - Fishpond operation - Ecotourism by community - Mangrove rehab	
13. Coastal Resource Management	- Training of bantay dagat - Establishment of Sasmuan Bangkung Malapad Critical	

Parameters	Brgy. Batang Dos	Municipal
	Habitat and Ecotourism Area (SBMCHEA)	
14. Coastal Law Enforcement		
- Existing law enforcement groups/agencies and perceived level of enforcement (1=No enforcement, 5=Very strong enforcement)	- Bantay Dagat (4) - Brgy. Tanod (5)	
- Level of compliance to existing CRM-related rules, laws (1=No compliance, 5=Very strong compliance)	- 4	
- Existing activities in the area which are destructive or cause damage	- Nanggagasang - Trawl - Sudsod - Trimming of mangroves - Discharge of water effluents from fishponds	

LEGEND:

Resources

Fish
1 ayungin
2 biya
3 kanduli
4 kitang
5 tilapia
6 apahap
7 banak
8 bakoko
9 balulungi (needle fish(red)
10 asohos
11 bidbid
13 biko
14 karpa
15 dalag
16 palos

Crustaceans
17 swahe
18 dapil
19 ulang
20 alamang
21 alupihang dagat

Mollusks
22 crabs (mudcrab)
23 blue crabs (alimasag)
24 talangka (river crab)
25 tahong
26 kapis
27 luloban

Others
28 samaral
29 gourami

Uses, Livelihood, Opportunities
A fishing
B gleaning
C tourism
D marine transportation
E organizing fishing community
F mangrove management
G aquaculture

Problems, Issues, Conflicts
I trawl (dagat)
II nanggagasang
III sudsod
IV bunbun
V discharge

Figure 4. Community Resource Map of Brgy. Batang Dos, Sasmuan, Pampanga (2017).

B. Mangrove

Mangrove forest is considered a major coastal resource that greatly contributes to the country's economy and in maintenance of ecological balance. Mangroves are salt-tolerant evergreen forests found along coastline. They are important ecosystems providing wood, food, fodder and medicine. A wide range of fish and shellfish depends on mangrove and help coastal area from storm surge.

Transect 6 (seaward, Pagatpat area)

Transect 5 (middle, mix species)

Transect 4 (middle, Pagatpat area)

Transect 3 (middle, Bakawan area)

Transect 2 (middle, Bakawan area)

Transect 1 (edge of Bangkung Malapad islet, mixed with *Acanthus* spp.)

Figure 5. Mangrove area per transects assessed in Bangkung Malapad, Brgy. Batang Dos, Sasmuan, Pampanga (2017).

Description of the Area

Based on the 2016 Community Resource Assessment and Ground Validation of the Proposed Sasmuan Critical Habitat and Ecotourism Area, assessed mangrove areas in Brgy. Batang Dos have two (2) types of mangrove area identified as riverine and overwashed. Mangroves in riverbanks are classified as riverine estimated to have a total area of 3.1 ha while islet is classified as overwashed with 11 ha. The riverine mangrove forest is located inland and are scattered in patches, sparsely spaced or having widely spaced intervals at the coastal area portion. Some are in thin and thick dense and sparse margins of the riverbank outlining the labyrinth river system of the barangay. Meanwhile, the overwashed mangrove forest representing the bulk of the mangrove area in Brgy. Batang Dos is located in Bangkung Malapad islet, which is generally a mangrove area. This overwash type is also a fringe type of mangrove forest.

Mangrove areas with bakawan or *Rhizophora spp.* are characterized by deep muddy substrate while areas with palapat or *Sonneratia spp.* have semi-sandy to shallow muddy substrate. Existing or old growth mangroves were usually tall ranging to about 6 to 18 m in tree height and found in clusters. Newly planted *Rhizophora spp.* mangroves in Bangkung Malapad are found inside at a vacant space in the center of mangrove forest north of the boardwalk while there were some planted in the mudflat at the lower western part of the Bangku and some at the eastern part just near the docking area of the boardwalk.

Species Composition

Based on the seven (7) transect stations assessed, results show that there are ten (10) mangrove species belonging to five (5) families found in Brgy. Batang Dos. These are *palapat asu* (*Sonneratia alba*), *bakawang lalaki* (*Rhizophora apiculata*), bakawang babae (*Rhizophora mucronata*), *palapat tutu* (*Sonneratia caseolaris*) *dalwari baligtad* (*Acanthus ilicifolius*), *dalwari masuksuk (Acanthus ebracteatus)* and *dalwari bilug* (*Acanthus volubilis*), apiapi (*Avicennia rumphiana* and *Avicennia alba*) and nipa (*Nypa fruticans*). A total of 972 trees were counted. The list of observed mangrove species is shown in Table 2. Figure 5 presents the percent composition of mangrove species. An inventory of mangrove species was also prepared and described in Table 3.

Table 3. Species composition and conservation status of mangroves in Brgy. Batang Dos, Sasmuan, Pampanga (2017).

| No.	Scientific Name*	Common Name*	Family Name*	Conservation Status (IUCN*)	Percent Compo-sition
1	*Acanthus ebracteatus*	Dalwari masuksuk	*Acanthaceae*	*Least concern*	*1.85%*
2	*Acanthus ilicifolius*	Dalwari baligtad	*Acanthaceae*	*Least concern*	*1.95%*
3	*Acanthus volubilis*	Dalwari bilug	*Acanthaceae*	*Least concern*	*1.13%*
4	*Avicennia alba*	Apiapi	*Avicenniaceae*	*Least concern*	*0.10%*
5	*Avicennia rumphiana*	Apiapi	*Avicenniaceae*	*Vulnerable*	*0.21%*
6	*Nypa fruticans*	Sasa	*Palmae*	*Least concern*	*0.10%*
7	*Rhizophora apiculata*	Bakawang-lalaki	*Rhizophoraceae*	*Least concern*	*25.72%*
8	*Rhizophora mucronata*	Bakawang-babae	*Rhizophoraceae*	*Least concern*	*13.17%*
9	*Sonneratia alba*	Palapat asu	*Lythraceae*	*Least concern*	*48.77%*
10	*Sonneratia caseolaris*	Palapat tutu	*Lythraceae*	*Least concern*	*7.00%*
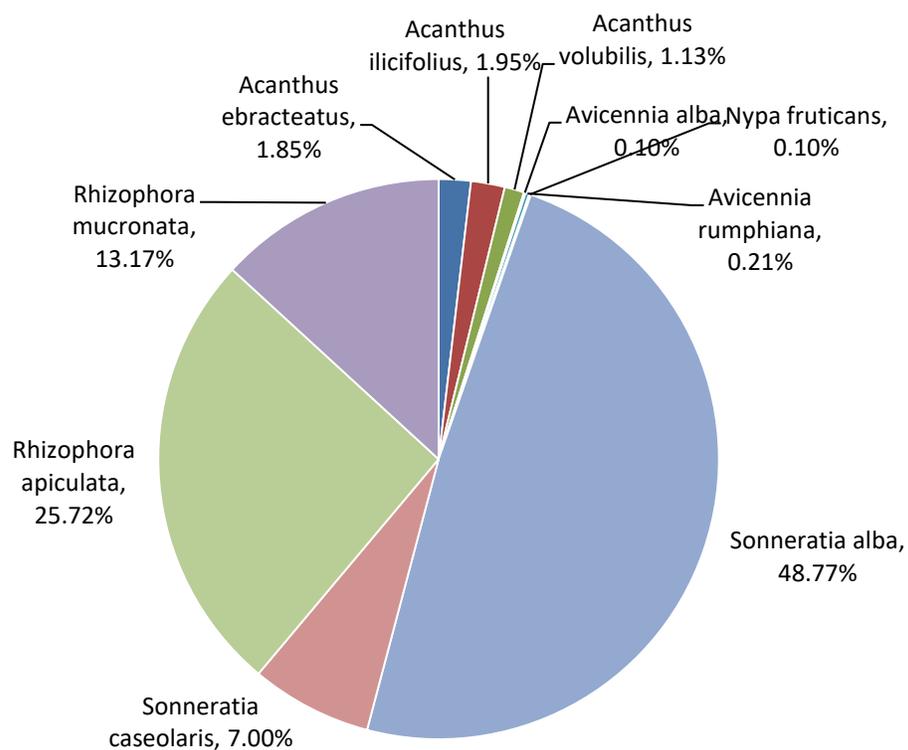
Figure 6. Percent Composition of Mangrove Species at Brgy. Batang Dos, Sasmuan, Pampanga (2017).

Table 4. Inventory and description of mangrove species found in Brgy. Batang Dos, Sasmuan, Pampanga (2017).

No.	Scientific Name	Name and IUCN Status	Description* and Location**
1	*Acanthus ebracteatus (AE)*	Common Name: Dalwari masuksuk Family Name: *Acanthaceae* IUCN Status: Least concern	These are erect shrubs with thick, stiff stems and nodes (leaf insertions) with sharp spines. Leaves are called mangrove thistle or sea holly because leaves are serrate, deeply lobed with sharp spines; dark green and shiny. The petals of the flowers are white with shorter inflorescence. Location: Transect 1
2	*Acanthus ilicifolius (AI)*	Common Name: Dalwari baligtad Family Name: *Acanthaceae* IUCN Status: Least concern	These are low, sprawling shrubs with thick, stiff stems and spiny nodes. Leaves are called mangrove thistle or sea holly with serrate margins, slightly lobed with sharp spines that is pale to yellow green and glossy. The petals of the flower is light blue with purple hue and longer inflorescence. Location: Transect 1
3	*Acanthus volubilis (AV)*	Common Name: Dalwari bilug Family Name: *Acanthaceae* IUCN Status: Least concern	These are semi-erect to sprawling, climbing shrubs with slender stems and nodes unarmed or with 2 small spines. The margins of the leaves are usually smooth in younger leaves, older ones may have small spines and is colored dark green. The petals of the flower is white with shorter inflorescence. Location: Transect 1
4	*Avicennia alba (AA)*	Common Name: Apiapi Family Name: *Avicenniaceae* IUCN Status: Least concern	Medium-sized trees, which tolerate high salinity and colonize the soft, muddy banks of rivers and tidal flats. The tree's usual location is low intertidal, marine. Leaves are pointed, slender and its underside is whitish to silver. The flowers are small, light orange with subtle scent. Fruits are distinctly elongated, pointed, chili-like and pale green. Bark are sooty black and rough. Location: Transect 5
5	*Avicennia marina (AM)*	Common Name: Apiapi Family Name:	The most widely distributed mangroves forming stands located at low to mid-intertidal marine to intermediate estuarine. Leaves are smaller, dark green to yellow,

No.	Scientific Name	Name and IUCN Status	Description* and Location**
		Avicenniaceae IUCN Status: Least concern	blades flat to curly. Flowers are small, yellow, slight scent. Fruits are heart-shaped with beak, light green to yellow, slightly hairy. Bark are shiny, flaky, light green to light brown. Location: outside transects, near Transect 5
6	*Avicennia rumphiana (AR)*	Common Name: Apiapi Family Name: *Avicenniaceae* IUCN Status: *Vulnerable*	Medium to large trees, located at mid-intertidal to back mangrove, also near upstream estuarine creeks. Leaves are rounded, undersurface brownish and hairy, terminal leaves point upwards. Flowers are small, darker yellow, distinct scent. Fruits are small, heart-shaped, yellowish-brown and hairy. Bark are light to dark and rough. Location: Transect 7, outside transect and near Transect 5
7	*Nypa fruticans (NF)*	Common Name: Sasa Family Name: *Palmae* IUCN Status: Least concern	The only palm among mangrove, *Nypa fruticans* that forms extensive belts or individual plants found in mixed mangrove communities. It has creeping stems called rhizomes from which tall compound leaves arise. Commercially important for many uses. Location: Transect 1
8	*Rhizophora apiculata (BL)*	Common Name: Bakawang-lalaki Family Name: *Rhizophoraceae* IUCN Status: Least concern	Medium to tall trees reaching 20 m located at low to mid-intertidal to marine. Leaves are narrow, dark red interpetiolary stipules. There are 2 sessile flowers on short (1-2 cm) peduncle. Propagules are up to 30 cm long, dark green, smooth. Location: Transect 1, 2, 3, 4 and 5
9	*Rhizophora mucronata (BB)*	Common Name: bakawang-babae Family Name: *Rhizophoraceae* IUCN Status: Least concern	Medium to big trees reaching 15m to 30m located at low to mid-intertidal marine to estuarine. Leaves are broadest, light green interpetiolary stipules. Flowers are pendulous, stalk with 6-8 flowers; short style. Propagules are the largest up to 80 cm long, green to dark green and warty. Location: Transect 1, 2, 3, 4 and 5
10	*Sonneratia alba (SA)*	Common Name: Palapat asu	Pioneering species of medium to large trees, located at seaward; low to mid-intertudal, high salinity and associated with *A. marina*.

No.	Scientific Name	Name and IUCN Status	Description* and Location**
		Family Name: *Lythraceae* IUCN Status: Least concern	Leaves have big rounded shape, with thick, light green petiole. Flowers have white filaments and petals. Fruits are smooth with calyx lobes reflexed or spread out. Seeds are large, U to V-shaped and pointed. Location: Transect 1, 2, 3, 4, 5 and 6
11	*Sonneratia caseolaris (SC)*	Common Name: Palapat tutu Family Name: *Lythraceae* IUCN Status: Least concern	Prominent trees located at low to mid-intertidal, along upstream rivers, low salinity found with *N. fruticans.* Leaves are smaller, elliptical, thin, reddish petiole, end branches drooping. Flowers have filaments with red base and white tips and red petals. Fruits are shiny, top-shaped with long style; calyx reflexed; fruit edible. Seeds have shape similar to, but 1/4 the size of *S. alba.* Location: Transect 1, 2, 3, 4 and 5

 * Description is derived from Primavera J.H., R.S. Sadaba, M.J.H.L. Lebata and J.P. Altamirano. 2004. **Handbook of Mangroves in the Philippines - Panay**. SEAFDEC Aquaculture Department, Iloilo, Philippines. 106 pp.

 ** Location is based on results of assessment.

Relative Abundance Percent

The top three (3) dominant mangrove species are *palapat asu* or *Sonneratia alba* (*S. alba*) at 48.77%, *bakawang lalaki* or *Rhizophora apiculata (R. apiculata)* at 25.72% and *bakawang babae* or *Rhizophora mucronata (R. mucronata)* at 13.17%. Relative abundance of mangrove species is presented here emphasizing dominant and species with low values.   Meanwhile, three species with noted low value are: *Avicennia rumphiana* or apiapi at 0.21%, *Avicennia alba* or apiapi at 0.10% and *Nypa fruticans* or *sasa* at 0.10%.

Figure 7. Mangrove area per transects assessed in Bangkung Malapad, Brgy. Batang Dos, Sasmuan, Pampanga (2017).

Being the most dominant mangrove species, *S. alba* mangrove trees are found in clusters that is vastly distributed all over Bangku from the southern portion or seaward most portion to the center and northern part of the islet. They dominate the seafront, exhibiting territoriality of the area, precluding growth of any *Rhizophora spp* seedlings that have grown in the area. Taller *S. alba* tree releases plant sap or resin on the leaves of *Rhizophora* seedlings infesting its leaves, thereby killing the plant through time. The team note that there was a plantation of *Rhizophora spp* trees about five (5) meter high with intertwining stilt roots after the *S. alba* territory in Transect 6 on the seaward most portion of Bangku. These *Rhizophora* are mature enough to withstand the territoriality of the *S. alba*. Meanwhile, patches of *S. alba* were observed along the boardwalk at a random interval with *R. mucronata* and *apiculata* at the center or muddy part of the stretch of the transect south of the boardwalk. Then *S. alba* dominates again at the center of the islet, stretching from end to end of the mangrove forest exhibiting territoriality. Then just after the shrubs of *Acanthus spp.*, there were patches of *S. alba* trees again bordering the northern portion. *R. apiculata* and *mucronata* trees are mostly located on the inner part of Bangku.

The wide distribution of *S. alba* is attributed to the characteristics of its seeds because it is light and could be vastly distributed by water current, meanwhile propagules of *Rhizophora* are heavy and may need a favorable muddy substrate to settle down. Regeneration observed inside the transects assessed were *Rhizophora* because their propagules are heavy.
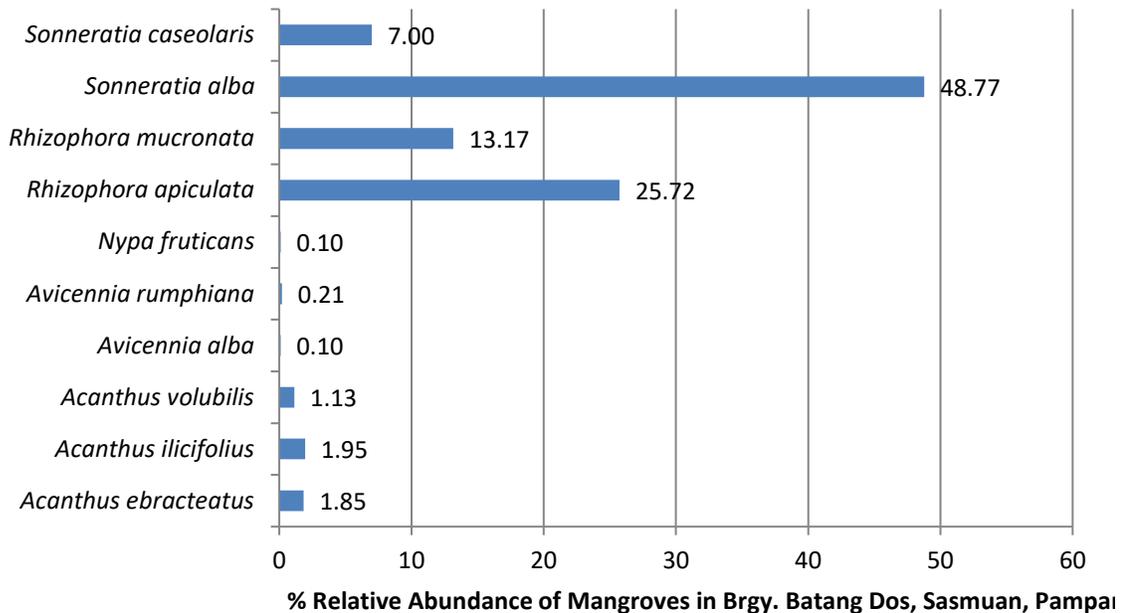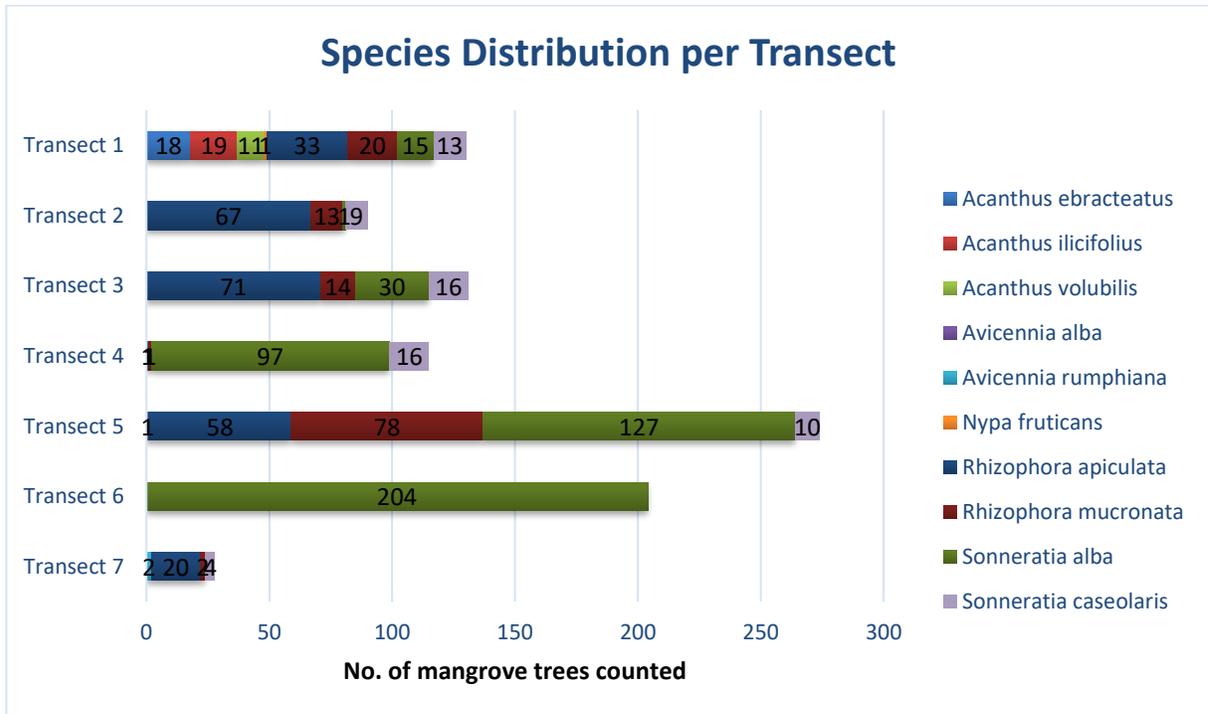

Figure 8. Mangrove area per transects assessed in Bangkung Malapad, Brgy. Batang Dos, Sasmuan, Pampanga (2017).

As per species distribution per transect presented in Figure 7, the diverse area is located on the northern portion, edge of Bangku islet having 7 mangrove species while the *S. alba* territory could be found in Transect 6 and 4. Rhizophora territory is found in Transect 2 and 3. The longest transects assessed is Transect 5 while the shortest is Transect 2.

General Result

The mangrove habitat assessment involves the determination of percent crown cover, regeneration per square meter (m^2) and average height in meters (m) of mature mangrove trees. Assessment results are presented in Table 5.

Based on results of assessment, mangrove percent (%) crown cover in all transects except Transect 2 have at least 76% crown cover and are classified to be in **excellent** condition based on criteria (Table 1). Computed average percent mangrove crown cover is 129.04% categorized to be in excellent condition. Transect 2 percent crown cover of 53.45% is considered to have a good condition, and is so far the lowest percent crown cover among all transects. The area is characterized to be dominated by *Rhizophora apiculata* or bakawang lalaki trees with some vacant space at the western portion of the transect.

Meanwhile, the computed average mangrove tree height in all seven (7) transects is 7.98m considered to be an excellent condition. All transects except Transect 6 have at least 5m mangrove tree height and based on criteria is an excellent condition. The transect with the highest average mangrove tree height is in Transect 2, dominated by *Rhizophora apiculata* or bakawang lalaki mangroves. Meanwhile, the lowest average mangrove tree height is in Transect 6 classified as good condition where the area is dominated by *Sonneratia alba* or pagatpat trees.

For regeneration of mangroves, that is, the ability of the area to support growth of mangrove seedlings, assessment results show a 0.22 average regeneration per m^2 considered to be in poor condition. This is attributed to the dense mangrove forest having crown cover of more than 100% not permitting sunlight to penetrate, territoriality of mangrove species such as *Sonneratia alba* and a unique mixed of mangrove trees. All transects in Bangkung Malapad islet has poor regeneration while the riverine transect has a fair regeneration at 0.89 and is the highest regeneration attributed to the location of the area being landward where mangrove propagules and seedlings tend to settle down. Meanwhile, the lowest regeneration is 0.04 found in Transect 4 that is located at the middle of the islet and is composed of almost *Sonneratia alba* trees that is described to be territorial and does not allow regeneration of *Rhizophora spp.*

Overall condition of mangroves analyzed are based on the assessment results of the three (3) criteria, that is, percent crown cover, average height and regeneration per m^2. Results of the three criteria on each transect may not be all found to satisfy the equivalent condition based on Table 1, thus, have to be averaged. For example, in case of Transect 1, where percent crown cover is 119.34% categorized to be in excellent condition, average tree height is 5.71 in excellent condition and regeneration per m^2 is 0.39 is equivalent to poor, the overall habitat condition for Transect 1 is averaged to be in good condition. The same goes with the remaining six (6) transects. All transects except Transect 2 is considered to exhibit good condition. Transect 2 is found to have a fair condition because of low percent crown cover and regeneration.

Generally based on the computed average parameters of mangroves assessed in Brgy. Batang Dos, results show that the percent crown cover of 129.04% is classified to be in excellent condition, average tree height of 7.98m is categorized to be as excellent condition and regeneration per m^2 of 0.22 in poor condition, with a total average condition categorized to be **GOOD** where mangrove has slight disturbance and few cuttings.

Table 5. Summary of Computed Parameters in Brgy. Batang Dos, Sasmuan, Pampanga

Transect	Total Area Sampled (ha)	No. of Quadrats	Criteria			Habitat Condition
			% Crown Cover	Average Height (m)	Regenera-tion/m^2	
T1	600	6	119.34%	5.71	0.39	Good
T2	1,200	12	53.84%	12.93	0.11	Fair
T3	900	9	114.02%	9.18	0.26	Good
T4	900	9	106.85%	8.22	0.04	Good
T5	1,200	12	144.37%	6.33	0.11	Good
T6	900	9	100.86%	4.54	0.30	Good
T7	300	3	264.02%	9.20	0.89	Good
Total/ Average	5,800	58	129.04%	7.98	0.22	
Condition			Excellent	Excellent	Poor	Good

V. Summary

The Participatory Coastal Resource Assessment (PCRA) in Brgy. Batang Dos have promoted Coastal Resource Management (CRM) through PCRA as a tool to conserve and protect fishery resources through appreciation of present natural resources in the area. The activity have also generated a baseline information on the condition of coastal resources particularly mangrove and socio-economic condition of the coastal community. A profile of the area is hereby presented, as follows:

BIOLOGICAL COMPONENT

Coral	:	not present
Fish	:	to be determined
Seagrass	:	not present
Mangrove	:	11 species / 5 families

PHYSICAL COMPONENT

Length of coastline surveyed :		3.2 km (BFAR-CRM, 2013)
Total mangrove area	:	14.1 ha (DENR)
Islet (Bangkung Malapad):		11 ha
Riverbanks	:	3.1 ha

To effectively protect and manage the area, the following recommendations are hope to be adopted by the concerned agency and/or authority:

- Formulate and implement a strategic IEC campaign, e.g. community orientation and consultation emphasizing the importance and benefits of mangrove and a critical area;

- In any proposed management intervention, undertaking or conservation program, ensure that there is community involvement in any means; and

- To ease pressure on the natural resources and prior to establishing strict protection zones, support the coastal community in obtaining environment-friendly alternative livelihood through linkage or endorsement to external organizations or agencies.

VI.   References

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Appendix A. Summary of the PCRA Socio-Demographic Profile Interview

1. Name of the barangay: **Brgy. Batang 2nd**
2. Name of the municipality: **Sasmuan (Pampanga)**
3. Land area in hectares (specify whether barangay or municipality): 232.2101 ha
4. Length of coastline in kilometers: 3.2 km (BFAR-CRM, 2013)
5. Name of respondents/participants:

Name	Position, Organization/Sector
1. Christopher Turla	Brgy. Captain
2. Eusandre R. Tolentino	Brgy. Konsehal/fisherfolk
3. Elmer Tolentino	Brgy. Konsehal
4. Rudolf Vince Coronel	Youth Representative
5. Reynaldo Basco	MFARMC Chairman/fisherfolk

6. Household data
   - Number of households in the barangay: 4 (3.8) as of CRM Plan 2013
   - Average number of children in the family: 4
   - Average family size (include all those who are living in the house): 8
   - Educational attainment of family members (average/typical):
     - Fathers: high school graduate
     - Mothers: elementary graduate
     - Children: college level
   - How many families have toilets: 80%
   - How many families do not have toilets: 20%
   - How many families are engaged in fishing: 85%

7. Population and reproductive health
   - What is the total population of the barangay? 2,268
   - Percentage of community age:
     Children (0-9 yrs):   35%
     Youth (10-17 yrs): 20%
     Adults (18-49 yrs): 40%
     Elderly (50 yrs & above): 5%
   - What percentage of the population practice family planning method? 50%
   - What are the most common family planning methods being adopted by couples in the barangay?   birth spacing, pills, injectables

8. Type of housing materials:
   Percent of houses that have:
Type of roof:	0% tile	95% GI sheets	5% nipa/cogon grass
Type of walls:	0% tiled	80% cement	10% wood/plywood
	10% nipa/coconut fronds/bamboo		

9. Source of water
0% river/spring	95% dug well	5% jetmatic pump/artesian well
0% communal faucet	0% piped water	

10. Migration pattern (As perceived by respondents)
    ➢ Was there an increase or decrease of population living in the area for the past year?
    increase
    ➢ If there was an increase, from where? If a decrease, where have people migrated?
    natural population growth; however, there is a migration observed from neighboring towns and provinces

11. Occupational structure

Major occupations in the community	Estimated percentage of the population in this occupation	Estimated income from such occupations	Who usually does this (male, female, children or combination)
1. Capture Fisherfolks	90%	Php 200/day or 6,000/month	Male, Children
2. Professionals (Teachers, Engineers, Accountants)	5%	Php 20,000/month	Male, Female
3. Construction Worker	3%	Php 400/day	Male
4. Fishpond Operators (to include caretakers)	2%	Php 50,000/month	Male, Female

12. Religion/faith:
    ➢ What percentage of the community are:
       ◆ Catholics: 40%
       ◆ Protestants: 20%
       ◆ Muslims: 0%
       ◆ Seventh-day Adventists: 0%
       ◆ Iglesia ni Cristo: 0.1%
       ◆ Jehovah's Witnesses: 0%
       ◆ IEMELIF: 20%
       ◆ Others (Born Again): 19.9%

13. Community infrastructure (please list)
    Brgy. Hall   Day-Care Center   Public Cemetery
    Elementary School   Basketball Court(2)   Footbridge
    Church (4)   Board Walk & View Deck   Fish port
    Brgy. Health Center   Waiting Shed(2)   Concrete Road
    Brgy. Slope Protection

14. Environment-friendly enterprises or livelihood projects
    ➢ List coastal environment-friendly enterprises/livelihood projects existing in your area
       Name of project   Beneficiaries/participants   Assisting organizations
       1. Mangrove Rehab project Local Community   DENR

2. Fish Processing Project (Shrimp paste & fishsauce)   Women Locals
LGU/BFAR/DTI/DOST
3. Ecotourism   Local Community   LGU/DENR/DOT
4. Sari-sari Stores   Local Community   DSWD

15. People's organizations (POs) or management organizations (e.g., FARMCs, etc.) existing in the community

People's Organizations (POs)	When established	Formal or Informal	Main functions/area of concern
1. BFARMC	2001	Formal (Mandated)	Fisherfolk
2. Concerned Citizens of Batang 2nd (CCB2)	1998	Formal (SEC)	Professionals
3. Women's Group of Batang 2nd	2016	Informal	Women
4. Sasmuan Bangkero Association	2017	Informal	Boat Operators
5. Sasmuan Fishpond Operators Association	2017	Formal (SEC)	Fishpond operators

16. Influential stakeholders

Coastal activity	Influential stakeholder group	Comments/remarks
Fishing	BFARMC	Management
Gleaning	BFARMC	Management
Tourism	CCB2, LGU, NGA, Women's Group of Batang 2nd	Promotion, Management
Marine transportation	Sasmuan Bangkero Association	To be organized
Residential development	-	-
Organizing fishing community	BFARMC	
Mangrove management	Local Community	
Aquaculture	Sasmuan Fishpond Operators Association	

17. Perceptions of resource conditions

Component	Percent (%) of participants that describe current resource conditions as:				
	Very good (1)	Good (2)	Neither good nor bad (3)	Bad (4)	Very bad (5)
Mangroves	45%	50%	5%	-	-
Coral reefs	N/A	N/A	N/A	N/A	N/A
Seagrass beds	-	-	5%	90%	5%
Beaches	N/A	N/A	N/A	N/A	N/A
Freshwater	N/A	N/A	N/A	N/A	N/A
Upland forest	N/A	N/A	N/A	N/A	N/A
Fishery	90%	10%	-	-	-

18. Coastal activities
 ➢ List coastal zone uses/activities taking place in the community. Indicate whether done by the community residents or outsiders.

Fishing by residents & outsiders   Ecotourism by community

Dredging byDPWH   Mangrove rehab project by DENR & BFAR

Fish processing by women   Fish shelter (bumbon) by fisherfolk

Fishpond Operation by operators   Gleaning by fisherfolk

19. List all major aquaculture and mariculture activities undertaken in your barangay/municipality

Types of mariculture/ aquaculture project/activities	No. of owners/operators and from where
Fishpond Operation(bangus, sugpo, crabs)	8 operators
Fish shelter (bumbon)	4 operators with 10 units each
Fish trap (biyakos)	2 operators with 2 units each

20. Coastal law enforcement
    a. What are the existing law enforcement groups/agencies in your community (Bantay-Dagat, fish warden, police, Coast Guard, etc.)
    Bantay-dagat, Brgy. tanod

    b. Perceived level of enforcement
    ➤ Ask participants to rate level of enforcement of CRM-related rules, laws in the community. (1=No enforcement, 5=Very strong enforcement)
         Bantay-dagat <u>4</u>   Brgy. Tanod <u>5</u>

    c. Compliance
    ➤ Ask participants to rate level of compliance to existing CRM-related rules, laws. (1=No compliance, 5=Very strong compliance) <u>4</u>

21. Existing activities in the area which are destructive or causing damage to your coastal area

Nanggagasang   Trimming of mangroves

Trawl   Discharge of water effluents from fishponds

Sudsod

Which of these are illegal?
All of the above

Perceived threats
All of the above

22. Awareness on CRM
    ➤ Are there existing programs/activities in your barangay about CRM? <u>Yes</u>

> ➤ If yes, what are these? Establishment of Sasmuan Bangkung Malapad Critical Habitat and Ecotourism Area (SBMCHEA), and training of bantay-dagat
> ➤ In your assessment, what percentage of the barangay has learned/knew of existing programs/activities? 50%
> ➤ What is the level of community participation with regard to activities and programs on CRM?

23. What are your suggested coastal management solutions to these problems?
    Updating of Municipal Ordinance, implementation of other conservation projects

24. Fishery Resources Conditions, Management and Potential
    (*Note: Key informant respondents maybe taken from the interview group. It is important that the KIs here are actual fishers preferably those who have been using different types of gears. As much as possible the KIs should be those fishers who have been fishing in the area for a longer period of time*)

a. Top ten fishes, crustaceans, mollusks

PRESENT		PAST	
List top 10 fishes, crustaceans, mollusks	Approximate number of pcs in 1 kilo?	List top 10 fishes, crustaceans, mollusks	Approximate number of pcs in 1 kilo?
Ayungin	30 pcs	Samaral	8 pcs
Biya	20 pcs	Gurami	10 pcs
Kanduli	4 pcs		
Kitang	8 pcs		
Tilapia	5 pcs		
Apahap	2 pcs		
Banak	10 pcs		
Bakoko	5 pcs		
Swahe	50 pcs		
Hipong puti	50 pcs		
Ulang	10 pcs		
Alimango	6 pcs		
Alimasag	15 pcs		
Alamang			
Tahong	40 pcs		
Kapis	15 pcs		
Talangka	25 pcs		
Needlefish (red)	30 pcs		
Dalag	3 pcs		
Asohos	20 pcs		
Bidbid	6 pcs		
Bangus	4 pcs		
Biko	10 pcs		
Alupihang Dagat	25 pcs		
Palos	2 pcs		
Karpa	1-2 pcs		
Other marine organisms (algae, agar, etc.)			
Gracilaria			
Sulib			

b. List the fishery resources or marine organisms that used to be present before but are currently no longer found or just rarely caught

Fishery resources/marine organism	When were these present?
Samaral	
Gurami	

25. Fishers, fishing crafts and gears
    a. Boats: (c/o MAO)
    Motorized ~100   How many of these are municipal?   all
                            How many of these are commercial?   none

    Non-motorized ~ 50

    b. Fishers
    Total no. of fishers 101 registered   How many fish full time? 50
                                            How many fish part time? 51
    Are the fishers in the area registered? Yes 90%   No   10%

    c. Fishing Gears
    How many in the barangay use the following gears? (pictures to help community identify gears)

Types of gears	How many
Pante (gillnet/crabnet)	20
Scoopnet	10
Crab pot	20

26. Trend diagram. Fishery and other CRM conditions and perceived trends (trend and calendar diagrams)
    ➢ Using the trend diagram template, ask individual participants to list in the individual worksheets gears as well as fish caught in the part and currently. Start with current (2004) and work backwards.
    ➢ Plot individual outputs in the bigger trend diagram template (preferably on Manila paper)
    ➢ Indicate icons for each gear.

    ➢ Include number of fishers for each gear through time.

    As of November 2017 FishR Data

Brgy	Capture Fishing	Aquaculture	Fish Vending	Gleaning	Fish Processing	Others
Batang Dos	52	14	0	9	1	17

a.   Fish catch (e.g., Average fish catch of hook and line fisher since 1970 until now)
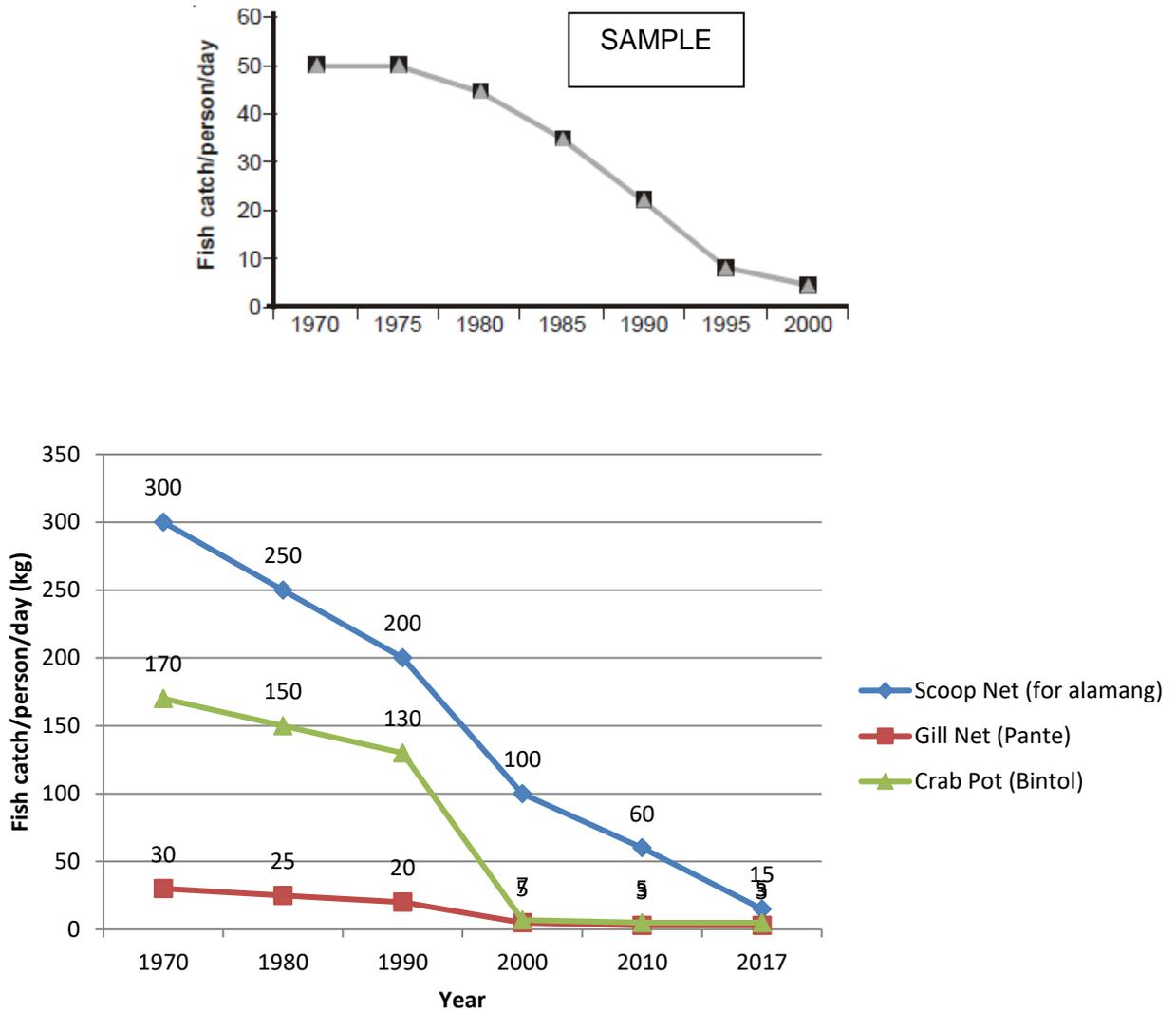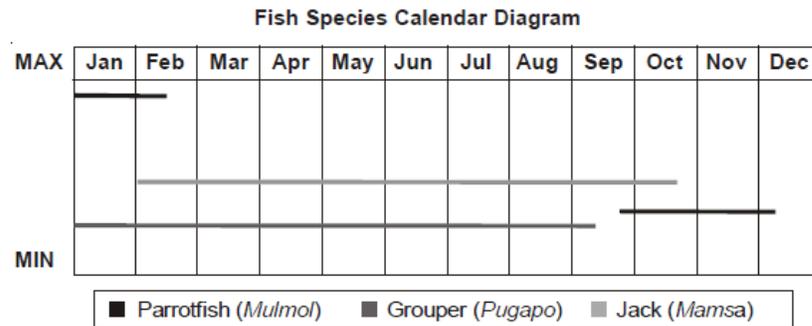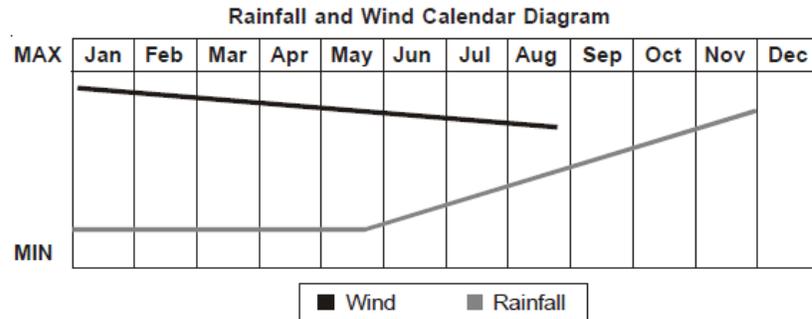   See illustration below:

Figure 9. Trend diagram indicating fish catch in Brgy. Batang Dos, Sasmuan, Pampanga.

27. Calendar diagram. Using the calendar diagram template, ask the participants to illustrate in the diagram situation of fishing activity, fishery activity, fishery and other socioeconomic conditions. The types of information that could be included in the calendar diagram are wind pattern, seasonality, type of fishes caught during certain seasons or months, type of gear used during a certain season/month, issues/problems occurring in specific time of the year, etc.
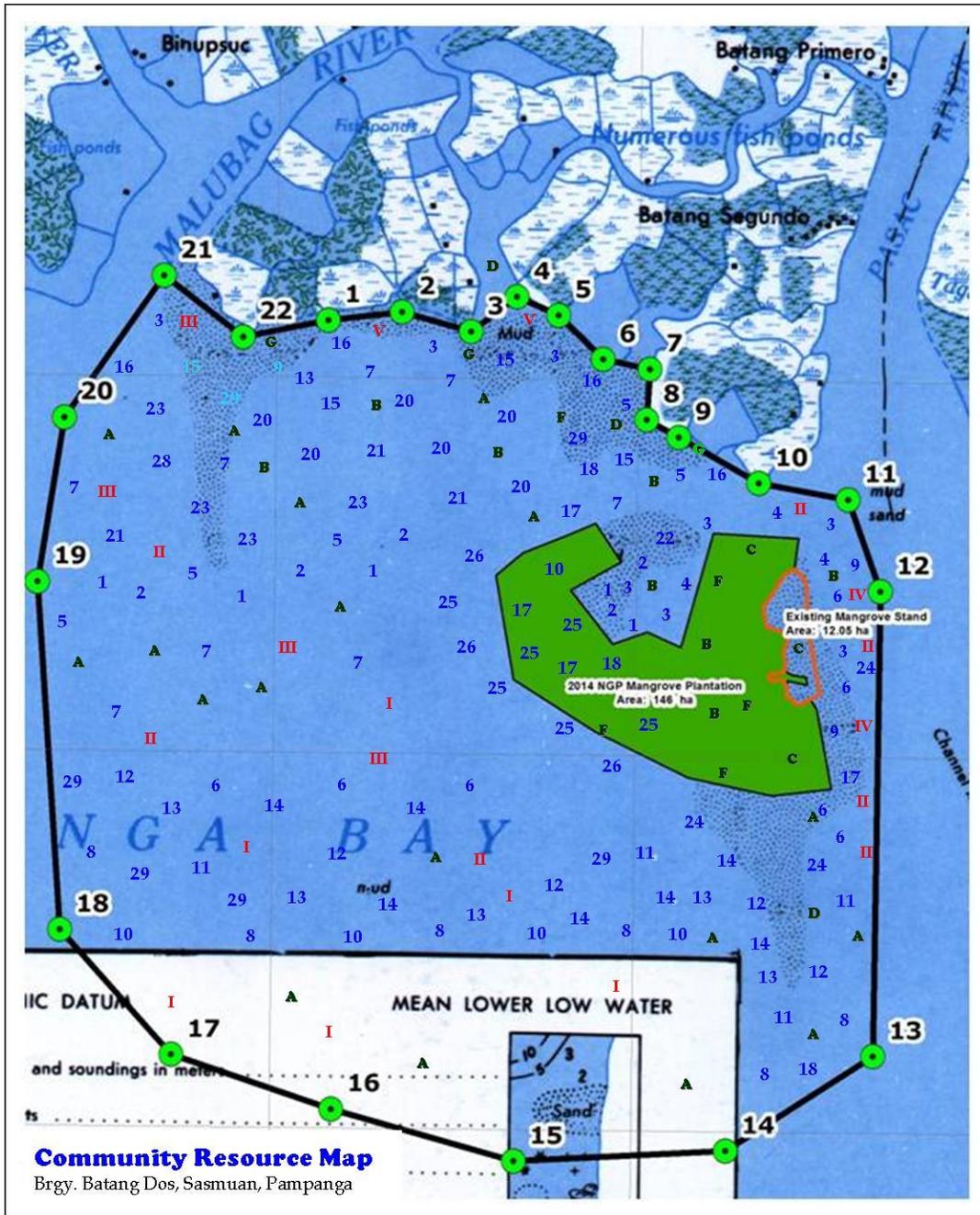
Examples:

Rainfall and Wind Calendar Diagram

■ Wind   ■ Rainfall

Fish Species Calendar Diagram

■ Parrotfish (*Mulmol*)   ■ Grouper (*Pugapo*)   ■ Jack (*Mamsa*)

Note: Calendar diagram of fishing gears and seaweed production should also be gathered.

Table 6. Calendar Diagram of Fishery Resources in Brgy. Batang Dos, Sasmuan, Pampanga (2017).

Fish	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Crab	x	x	x	x	x						x	x
Ayungin												
Bangus		x	x	x								
Tilapia												
Biya												
Asuhos					x						x	x
Bakawang lalaki (fruit)												x
Bakawang lalaki (flowering)												X

28. Use patterns, resources, problems, and issues (Note: Maybe done by key informants within the interview group)– see coastal resource map participatory prepared by the community during PCRA.

Community Resource Map
Brgy. Batang Dos, Sasmuan, Pampanga

LEGEND:

Resources

Fish
1   ayungin
2   biya
3   kanduli
4   kitang
5   tilapia
6   apahap
7   banak
8   bakoko
9   balulungi (needle fish(red)
10 asohos
11 bidbid

13 biko
14 karpa
15 dalag
16 palos

Crustaceans
17 swahe
18 dapil
19 ulang
20 alamang
21 alupihang dagat

Mollusks
22 crabs (mudcrab)

23 blue crabs (alimasag)
24 talangka (river crab)
25 tahong
26 kapis
27 luloban

Others
28 samaral
29 gourami

Uses, Livelihood, Opportunities
A fishing
B gleaning

C tourism
D marine transportation
E organizing fishing community
F mangrove management
G aquaculture

Problems, Issues, Conflicts
I   trawl (dagat)
II nanggagasang
III sudsod
IV bunbun
V discharge

Figure 10. Output of Community Resource Mapping.

Appendix B. Data Sheet for Mangrove Assessment

Appendix C. Data Sheet for Mangrove Regeneration

Appendix D. Photodocumentation

Prior to Mangrove Assessment - Training and Briefing

Transect 6, seaward, pagatpat area, bakawan seedling prone to diseases caused by sap of pagatpat trees.
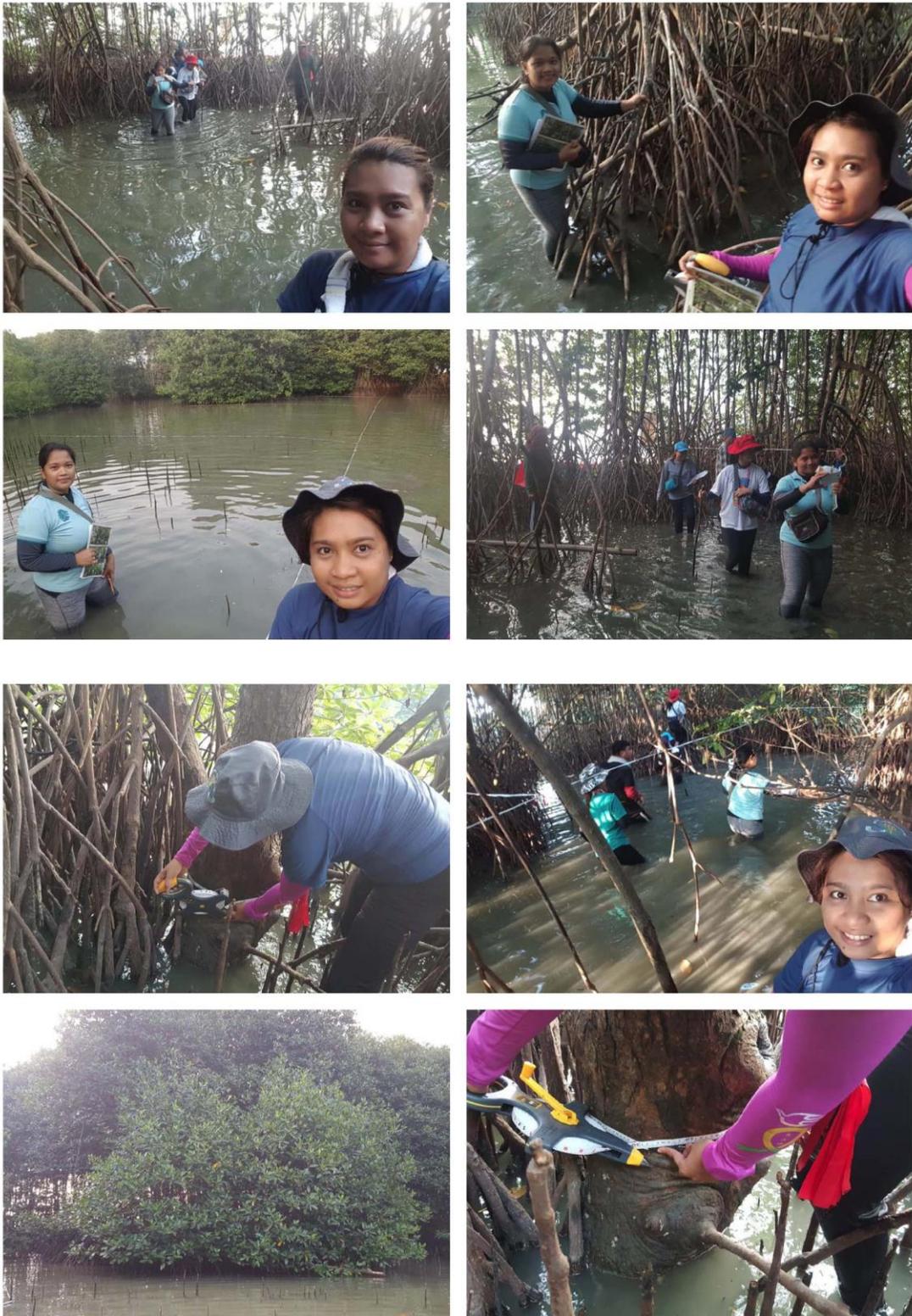
Transect 5, seaward, pagatpat area, bakawan seedling prone to diseases caused by sap of pagatpat trees.

Transect 4, middle, pagatpat dominated area.

Transect 2, middle, bakawan dominated area, with tallest trees in the Bangkung Malapad area.

Transect 3, middle, bakawan dominated area, with vacant space at the western portion and widest trunk.

Transect 1, edge of Bangkung Malapad islet towards landward, mixed species

Transect 7, outsude Bangkung Malapad islet, mixed species, near a fishpond