Department of Environment and Natural Resources
Ecosystems Research and Development Bureau
Forest and Wetland Research Development & Extension Center

February 17, 2023

MEMORANDUM

FOR : The Regional Executive Director
DENR MIMAROPA
Roxas Boulevard, Brgy. 668, Ermita, Manila

ATT'N : The CENR Officer
CENRO Socorro, Oriental Mindoro

FROM : The Head

SUBJECT : **COPY OF ASSESSMENT REPORT ON BAMBANIN AND KISLOYAN PEATLAND IN VICTORIA, ORIENTAL MINDORO UNDER THE PROJECT TITLED "UPDATING OF PROFILE/STATUS OF PRIORITY PEATLAND IN THE PHILIPPINES"**

This pertains to an email dated February 4, 2023 sent by CENRO Socorro requesting for copies or report and/or results of the survey mapping done derived from FGDs and soil and water collection in Kisloyan Peatland addressed to ERDB Director Maria Lourdes G. Ferrer.

In this regard, we are providing you a copy of assessment report of Bambanin and Kisloyan peatlands in Victoria, Oriental Mindoro which was completed between February and April of 2022.

For information and reference.

CONRADO B. MARQUEZ

cc : The Director, ERDB
College, Los Baños, Laguna

Maharlika, Bislig City, Surigao del Sur
Mobile No: 0917-703-0253
E-mail: erdbfwrdecgov@gmail.com

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Department of Environment and Natural Resources
Ecosystems Research and Development Bureau
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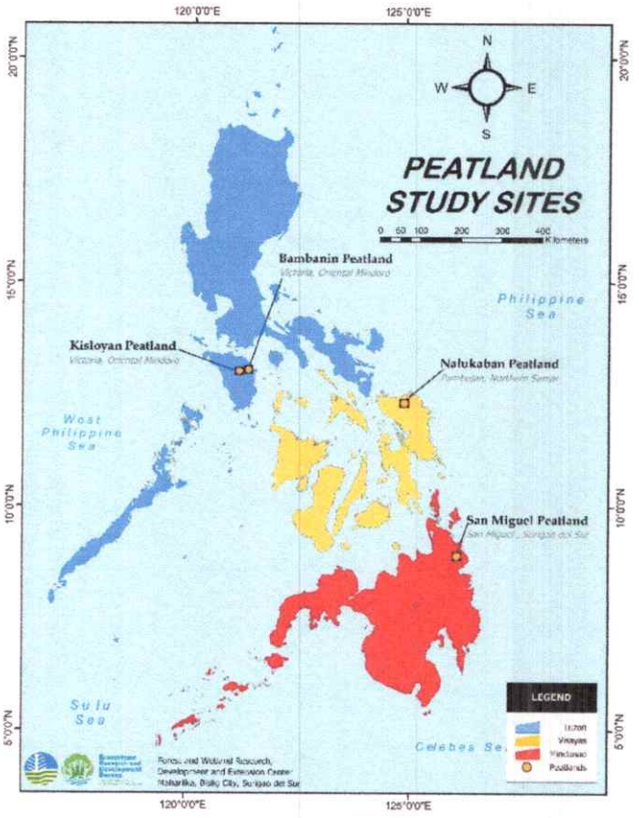
Assessment Report of Bambanin and Kisloyan Peatland in Victoria Oriental Mindoro

2022

A. BRIEF STATEMENT OF ACCOMPLISHMENT

METHODOLOGY

• STUDY SITES



Bambanin peatland is located in Barangay Bambanin, municipality of Victoria, Province of Oriental Mindoro. Covers 27.27 hectares, with coordinates, **13°07'10.20'' N** and **121°18'00.42'' E,** with elevation of 50 meters above sea level. About 50 kilometres from the city of Calapan, that will take an hour and twenty-one minutes to travel from Calapan Port to barangay Bambanin via RPV. One kilometre from Barangay Hall of Bambanin before reaching the site. The Bambanin peatland is passable by vehicle.

On the other hand, Kisloyan peatlands are located in Barangay Villa Cerveza, municipality of Victoria, province of Oriental Mindoro. Covers 27.14 hectares for Parcel 1 with coordinates of ***13* °05'34.77'' N, 121 °09'35.26'' E,** elevation of 168 meters above sea level *and 10.56 hectares for Parcel 2 with coordinates of* ***13* °04'21.75'' N, 121 °10'55.54'' E,** elevation of 232 meters above sea level. About 22 kilometres or 30 minutes of travel via RPV from the city of Victoria to Barangay Hall of Villa Cerveza. The peatland area is not passable by vehicle. Approximately 5 kilometres from Barangay Hall to the peatland area and about 4 hours of hiking. The distance from Parcel 1 to Parcel 2 is more or less 3.5 kilometres and about 4 hours of hiking. Rivers and creeks are present in the trail site.

The Kisloyan peatland has a climate information based on Modified Coronas Classification under Type III and classified as not very pronounced, relatively dry from November to April and wet during the rest of the year. Maximum rainfall occurred from

the month of June up to November. The highest raindrops during the month of October while the lowest occurred during the months of February to April.

- **SOCIO-DEMOGRAPHIC PROFILING**

The gathering of primary data sources was done by applying the triangulation method involving three major activities: Personal Interviews, Key Informant Interviews (KII), and Focus Group Discussions. As defined, triangulation refers to the use of multiple methods or data sources in qualitative research to develop a comprehensive understanding of phenomena (Patton, 1999). It has been viewed as a qualitative research strategy to test validity through the convergence of information from different sources.

For personal interviews, a survey was conducted randomly among the number of identified men and women respondents to assess their awareness of the ecological services of peatlands and the causes of their degradation. Slovin's formula was used to determine the sample from the pre-identified population with a confidence level of 0.05% margin of error. Pre-tested questionnaires were distributed to sample respondents to determine their socio-demographic and economic characteristics and their knowledge and awareness of peatlands. Simple statistics such as frequency counts and percentages were used to describe men and women respondents' responses through the descriptive method.

- **FLORA ASSESSMENT**

The recorded data in the field form were all collated, encoded, and computed using PAST Statistical Software. The computed biodiversity indices were then interpreted using the Fernando scale (**Table 1)** and Simpson Diversity Index Scores **(Table 2).**

Table 1. Biodiversity Scale (Fernando, 1998)

Relative Values	Shannon-Weiner Index	Evenness
Very High	3.5 – 4	0.75 – 1
High	3.0 – 3.49	0.5 – 0.74
Moderate	2.5 – 2.99	0.25 – 0.49
Low	2.0 – 2.49	0.15 – 0.24
Very Low	1.99 & below	0.14 & below

Table 2. Guidelines for interpreting Simpson Diversity Index Scores (Guajardo, 2015)

Simpson Score	Interpretation
0.00	Absence of diversity (homogeneity)
0.01-0.40	A low degree of diversity/heterogeneity
0.41-0.60	A moderate degree of diversity/heterogeneity
0.61-0.80	A moderately high degree of diversity/heterogeneity
0.81-0.99	A high degree of diversity/heterogeneity
1.00	Absolute (perfect) diversity/heterogeneity

- **FAUNA ASSESSMENT**

The assessment methods used in the identification of birds, amphibians, and other fauna were as follows; 1) The timed species counts (TSCs) method; In this method; observation, identification, and listing/recording were done within the station in the established 2-km transect in the area. Starting 15 minutes after sunrise and ends no later than 3.5 hours after sunrise and in the late afternoon from 4:00 PM to 5:30 PM. All bird species seen or heard during the observation period were recorded and documented (see Fig. 2).

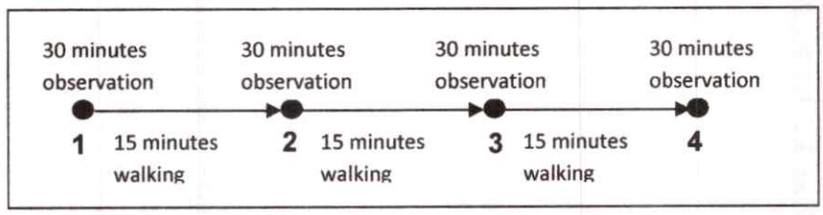


Figure 2: Timed species counts observations

- **MACRO-FUNGAL ASSESSMENT**

The recorded data in the field form were all collated, encoded, and computed using PAST Statistical Software. The computed biodiversity indices were then interpreted using the Fernando scale (**Table 3).**

Table 3. Biodiversity Scale (Fernando, 1998)

Relative Values	Shannon-Weiner Index	Evenness
Very High	3.5 – 4	0.75 – 1
High	3.0 – 3.49	0.5 – 0.74
Moderate	2.5 – 2.99	0.25 – 0.49
Low	2.0 – 2.49	0.15 – 0.24
Very Low	1.99 & below	0.14 & below

Table 4. Guidelines for interpreting Simpson Diversity Index Scores (Guajardo, 2015)

Simpson Score	Interpretation
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0.81-0.99	A high degree of diversity/heterogeneity
1.00	Absolute (perfect) diversity/heterogeneity

• SOIL CHARACTERIZATION

Soil quality assessment in Bambanin and Kisloyan Peatland at Victoria, Oriental Mindoro was conducted last April 4-14, 2022. Soil samples were collected from randomly selected sampling points. Four 3-cm core subsamples were collected, representing depth intervals of 0–15cm, 15–30cm, 30–50cm, and 50–100cm from each subplot. These cut-offs were based approximately on one of the few descriptions of soil horizons in Indo-Pacific mangroves (USDA 1983). Sets of soil monolith were also taken from 0-5 cm, 5-15 cm. 15-30 cm, 30-50 cm, and 50-100 cm depth from Bambanin, Kisloyan Parcel A and Kisloyan Parcel 2. The soil monolith shall represent the soil vertical formation within the area of Bambanin and Kisloyan. Collected soil samples were air-dried initially at the field to remove the excess moisture at the time of sampling. Soil samples were processed, labeled, and air-dried at FWRDEC Maharlika, Bislig City, and pulverized for analysis. Bulk soil samples were oven-dried at 60°C until stable in weight for the bulk density analysis.

Three methods for determining organic matter are given below.

1. The first is the classical Walkley-Black method. The calculation of organic matter assumes that 77% of the organic carbon is oxidized by the method and that soil organic matter contains 58% C.

2. The second method is a rapid method for routine analysis based on colorimetric determination of Cr 3+ ions produced. The first method is used to standardize the second.

3. The third method of estimating soil organic matter, loss of weight on ignition, is included because of hazards associated with the use of Cr2O72-. This ion in a strong acid medium is a powerful oxidant. It is corrosive to skin, mucous membranes, the respiratory tract and the gastrointestinal tract. It may create a cancer risk. Some municipalities restrict the amount of Cr that can be discharged into the sewage system. For these reasons, alternative procedures not involving Cr2O72- have been sought.

Reaction of Cr2O72- with organic matter.

a. Cr2O72- will react with carbon as follows:

2Cr2O72- + 3 C0 + 16 H+ ----> 4 Cr3+ + 3 CO2 + 8 H2O

b. Similarly, Cr2O72- will react with organic hydrogen as follows:

Cr2O72- + 6 H0 + 8 H+ ----> 2 Cr3+ + 7 H2O

c. The presence of organic oxygen will decrease the amount of total carbon oxidized by the Cr2O72- because of the following reaction:

RCOOH ----> RH + CO2

Reaction (b) tends to compensate for the loss of C due to reaction (c) so that the assumption that each C atom is oxidized from C0 to C4+ reflects the overall electron change in the reaction. The excess Cr2O72- is then back titrated with standard Fe2+ solution to determine the amount that has reacted, as shown in Equation 2:

Reaction of Fe2+ with Cr2O72-

a. Ferrous iron reacts with Cr2O72- as follows:

6Fe2+ + Cr2O72- + 14H+ ---> 2Cr3+ + 6 Fe3+ + 7 H2O

The soil bulk density (BD), also known as dry bulk density, is the weight of dry soil (M_{solids}) divided by the total soil volume (V_{soil}). The total soil volume is the combined volume of solids and pores which may contain air (V_{air}) or water (V_{water}), or botH. The average values of air, water and solid in soil are easily measured and are a useful indication of a soils physical condition.

The most common method of measuring soil BD is by collecting a known volume of soil using a metal ring pressed into the soil (intact core), and determining the weight after drying (McKenzie *et al.*, 2004).

Calculations:

Bulk density (g/cm^3) = Dry soil weight (g) / Soil volume (cm^3)

Bulk density is usually expressed in megagrams per cubic meter (Mg/m^3) but the numerically equivalent units of g/cm^3 and t/m^3 are also used (1 Mg/m^3 = 1 g/cm^3 = 1 t/m^3) (Cresswell and Hamilton, 2002).

The Soil pH was determined by Potentiometric method and Organic Matter was determined using Modified Walkley-Black Method through titration. Modified W & K method utilizes an external source of heat which permits heating to a higher temperature of 120 °C for the heat-of-dilution reaction of concentrated H2SO4 (Allison, 1965). The application of external heat, such as is done in the Schollenberger method (Schollenberger, 1927; Schollenberger, 1945), which gives a higher recovery of organic C and less variation in percent recovery among different groups of samples. Whereas P and K were determined by qualitative analysis using soil test kit. The Available N and organic carbon contents were calculated based on organic matter content using the formula:

$$\%\ N = \%\ Organic\ Matter \times 0.05$$

$$Soil\ Organic\ Carbon\ (\%) = \frac{Organic\ matter\ (\%)}{1.72}$$

. Moreover, the C/N ratio was computed using the formula:

$$C/N\ Ratio = \frac{\%\ Soil\ Organic\ Carbon}{\%\ Nitrogen}$$

- **WATER COLLECTION AND ANALYSIS**

Nine (9) parameters were assessed that included water acidity ((pH), Dissolve Oxygen (DO), Total Suspended Solids (TSS), Biological Oxygen Demand (BOD), Chloride, Phosphate, Nitrate, Color and fecal coliforms.

The standards for freshwater systems in the Philippines are listed in DENR's Administrative Order (DAO) 2016-08. The parameters that are available and relevant to this study are shown in Tables 5-6.

Table 5. Water quality guideline for Primary Parameters of Philippines freshwater bodies based on DAO 2016-08

Parameter	Unit	Water Body Classification								
		AA	A	B	C	D	SA	SB	SC	SD
BOD	mg/L	1	3	5	7	15	n/a	n/a	n/a	n/a
Chloride	mg/L	250	250	250	350	400	n/a	n/a	n/a	n/a
Color	TCU	5	50	50	75	150	5	50	75	150
Dissolved Oxygen[a] (Minimum)	mg/L	5	5	5	5	2	6	6	5	2
Fecal Coliform	MPN/100mL	<1.1	<1.1	100	200	400	<1.1	100	200	400
Nitrate as NO_3-N	mg/L	7	7	7	7	15	10	10	10	15
pH (Range)		6.5-8.5	6.5-8.5	6.5-8.5	6.5-9.0	6.0-9.0	7.0-8.5	7.0-8.5	6.5-8.5	6.0-9.0
Phosphate	mg/L	<0.003	0.5	0.5	0.5	5	0.1	0.5	0.5	5
Temperature[b]	°C	26-30	26-30	26-30	25-31	25-32	26-30	26-30	25-31	25-32
Total Suspended Solids	mg/L	25	50	65	80	110	25	50	80	110

Notes:
MPN/100mL – Most Probable Number per 100 milliliter
n/a – Not Applicable
TCU – True Color Unit
(a) Samples shall be taken from 9:00 AM to 4:00 PM.
(b) The natural background temperature as determined by EMB shall prevail if the temperature is lower or higher than the WQG; provided that the maximum increase is only up to 10 percent and that it will not cause any risk to human health and the environment.

Table 6. Water Quality Guideline and GES for Fecal Coliform for all water bodies

Water Body Classification	Unit	WQG	GES
Class AA	MPN/100 mL	20	NDA
Class A	MPN/100 mL	50	100
Class B	MPN/100 mL	100	200
Class C	MPN/100 mL	200	400
Class D	MPN/100 mL	400	800
Class SA	MPN/100 mL	20	NDA
Class SB	MPN/100 mL	100	200
Class SC	MPN/100 mL	200	400
Class SD	MPN/100 mL	400	800

Note: *NDA – No Discharge Allowed*
MPN/100mL – Most Probable Number/100 ml of sample

RESULTS AND DISCUSSION

• MAPPING AND GEOTAGGING

To determine the physical characteristics of Bambanin and Kisloyan peatlands, a survey, mapping delineation, and drone deployment were conducted to come up with the location and orthophoto maps last February 14-18, 2022. Aside from that, to determine the extent/boundary of two peatland sites, soil collection for OM determination was conducted. Six (6) meters of the bamboo pool were buried to measure its deepness and collected soil samples using an open-face soil auger. The laboratory results on the organic matter (OM) will be the basis for locating the exact boundary of peatland areas. (The analysis of collected samples is still ongoing)

Table 7. Location, size and status of the confirmed peatlands in Oriental Mindoro based on the secondary data collected

Peatland	Location	Size	Status
Bambanin peatland	Barangay Bambanin, Victoria Oriental Mindoro	27.27ha	Confirmed
Kisloyan peatland Parcel A	Barangay Villa Cerveza, Victoria Oriental Mindoro	27. 14ha	Confirmed
Kisloyan peatland Parcel B	Barangay Villa Cerveza, Victoria Oriental Mindoro	10.56ha	Confirmed

Bambanin peatland is located in Barangay Bambanin, municipality of Victoria, Province of Oriental Mindoro. Covers 27.27 hectares (Table 7), with coordinates, **13°07'10.20'' N** and **121°18'00.42'' E,** with an elevation of 50 meters above sea level. About 50 kilometers from the city of Calapan, that will take an hour and twenty-one minutes to travel from Calapan Port to barangay Bambanin via RPV. One kilometer from Barangay Hall of Bambanin before reaching the site. The Bambanin peatland is passable by any type of vehicle. (See *Figure 3* below)

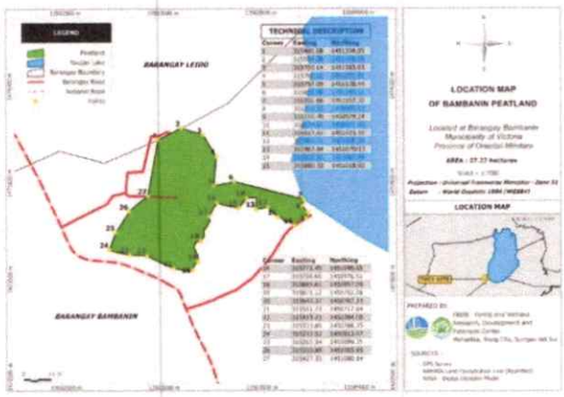

Figure 3. Location Map of Bambanin Peatland

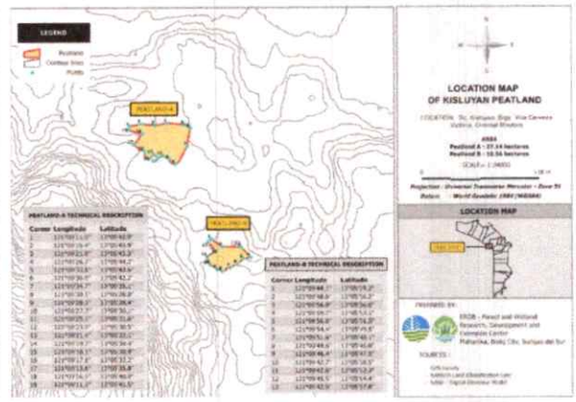

Figure 4. Location Map of Kisloyan Peatland Peatland

Figure 5. Orthophoto Map of Bambanin

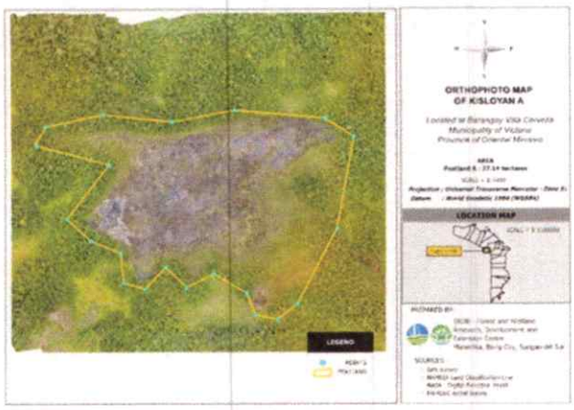

Figure 6. Orthophoto Map of Kisloyan parcel A

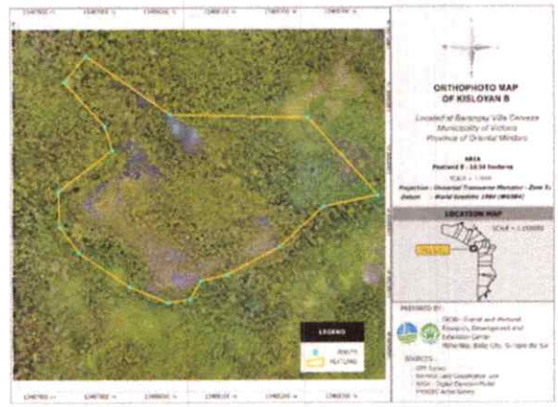

Figure 7. Orthophoto Map of KIsloyan parcel B

Kisloyan peatlands are located in Barangay Villa Cerveza, municipality of Victoria, province of Oriental Mindoro. Covers 27.14 hectares for Parcel 1 with coordinates of ***13*** **°05'34.77'' N, 121 °09'35.26'' E,** the elevation of 168 meters above sea level, *and 10.56 hectares for Parcel 2 with coordinates of* ***13*** **°04'21.75'' N, 121 °10'55.54'' E,** the elevation of 232 meters above sea level. About 22 kilometers or 30 minutes of travel via RPV from the city of Victoria to Barangay Hall of Villa Cerveza. The peatland area is not passable by vehicle. Approximately 5 kilometers from Barangay Hall to the peatland area and about 4 hours of hiking. The distance from Parcel 1 to Parcel 2 is more or less 3.5 kilometers and about 4 hours of hiking. Rivers and creeks are present at the trial site. (See *Figures* above).

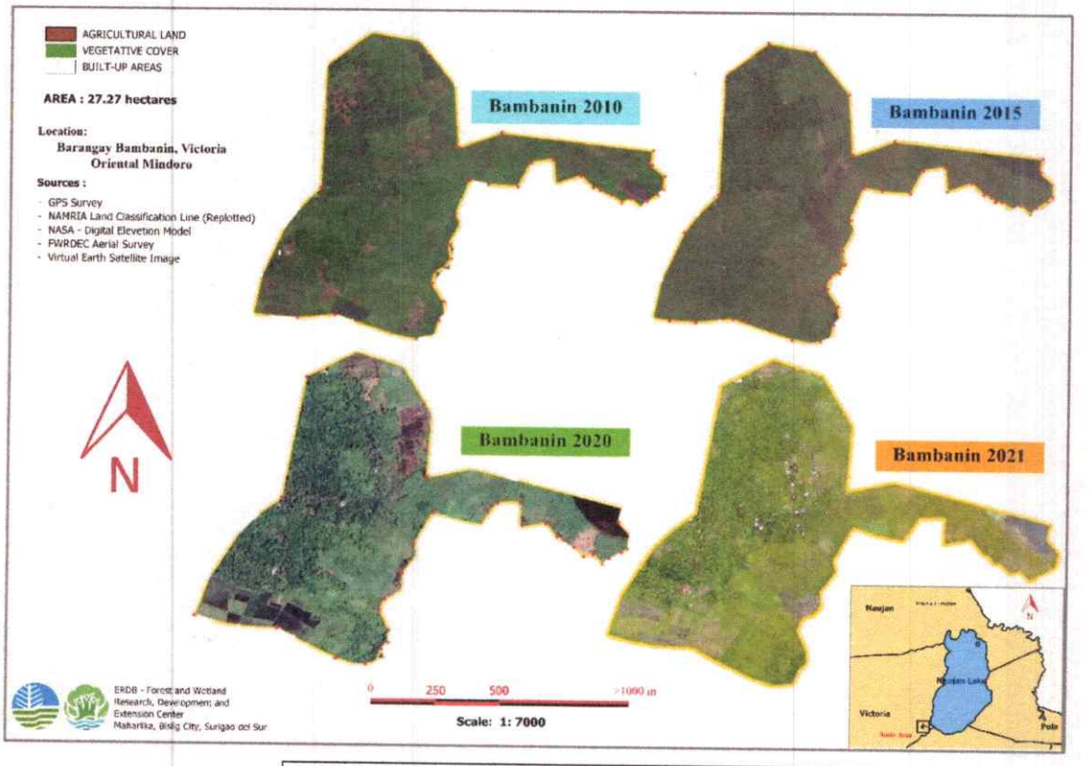

Figure 8. Bambanin Peatland Vegetation

Update of Bambanin peatland vegetation from 2010 to 2021. Figure 8 shows the changes of vegetation from 2010 of which agricultural activities evidently shown with minimal residential. The year 2015 large portion of peatland converted into agriculture. In 2020 almost half of peatland was converted and residential area was visibly seen.

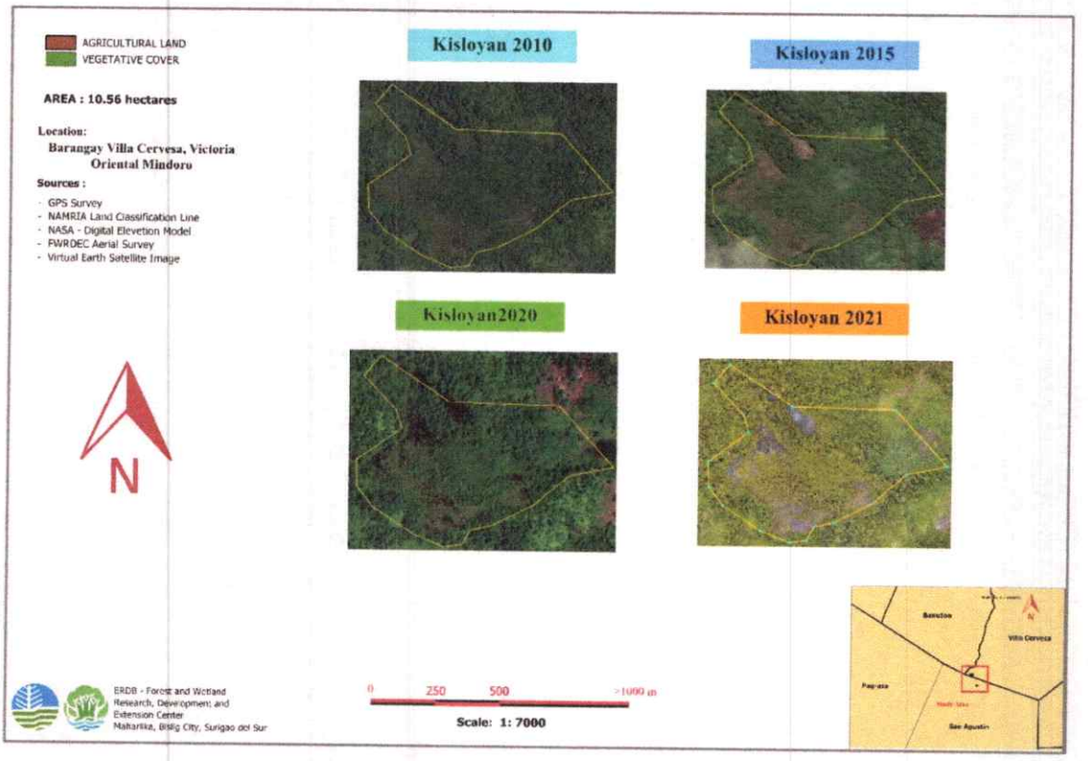

Figure 9. Kisloyan Peatland Vegetation

Kisloyan peatland 2 is a closed canopy peatland. The changes from 2010 to 2021. In 2010 portion of peatland shows a minimal open peatland and in 2015 the dense portion of forest was emphasized. On the year 2020 almost whole portion of peatland was a dense forest, visibly shown the closing of dense forest as trees continuously to grow greener and bigger. Year 2021 part of peatland shows a dense forest in the center with water surrounds. The trees in the center and in the side of the peatland almost connect to each other which made the peatland a closed canopy one.

- **SOCIO-DEMOGRAPHIC PROFILING**

Kisloyan Peatland

1.1 Socio-Demographic-Economic Profile

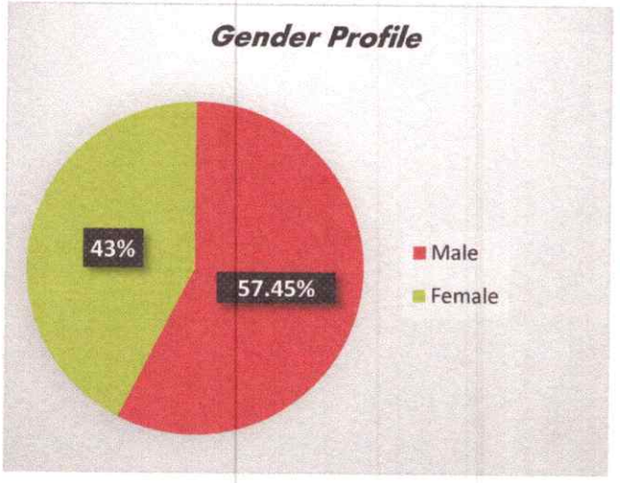

Figure 10. Gender Profile of Brgy. Villa Cerveza Villa Cerveza

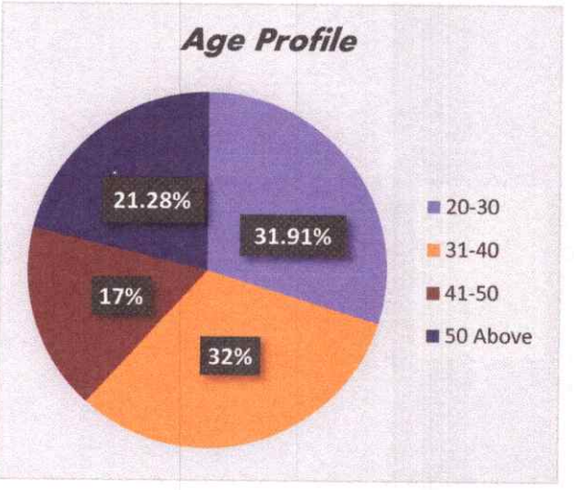

Figure 11. Age Profile of Brgy.

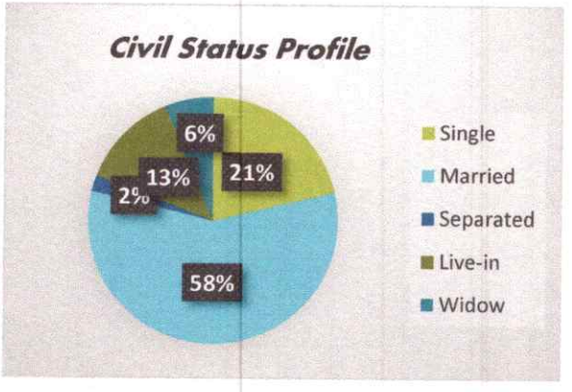

Figure 12. Civil Status Profile of Brgy. Villa Cerveza Brgy. Villa

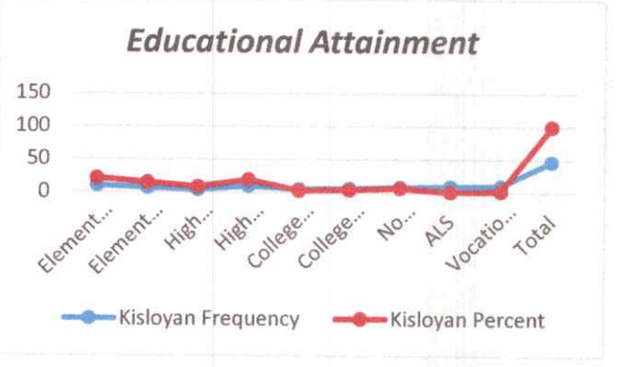

Figure 13. Educational Profile of

The graph reveals that out of the 47 men and women respondents interviewed in Kisloyan, Victoria, Oriental Mindoro, the majority are male (57.45%) aged between 31 to 40 years old (31.91%), and are married (57.45%). In terms of educational attainment, 24.71% finished primary education, 21.28% are at the elementary level, and 7.00% did not received formal education.

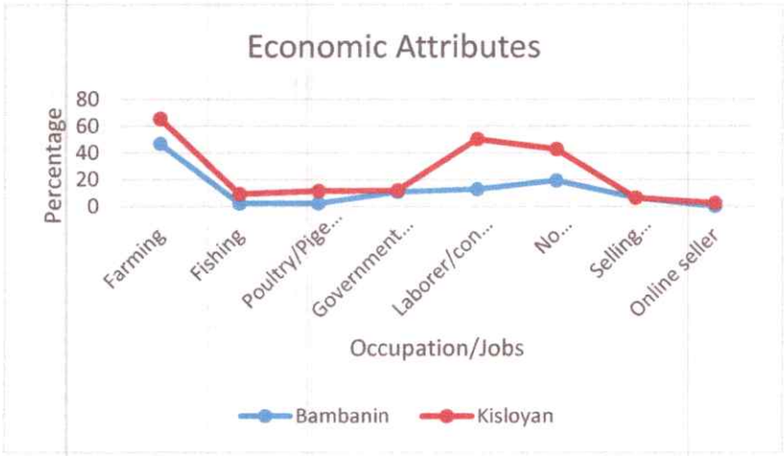

Figure 14. Economic Attributes of Brgy. Bambanin and Villa Cerveza

Figure 14 shows the economic attributes of Barangay Bambanin and Villa Cerveza. Data revealed that 46.81% of the men and women respondents are engaged in agricultural farming, 12.77% are laborers/construction workers, and 10.64% are government and private employed in Barangay Villa Cerveza. On the other hand, 9 out of 47 respondents in Barangay Bambanin or 19.15% have no work, 18.82% are engage in agricultural farming, 37.65% are laborers/construction workers, and 1.18% are employed and 23.53% of the respondents are unemployed.

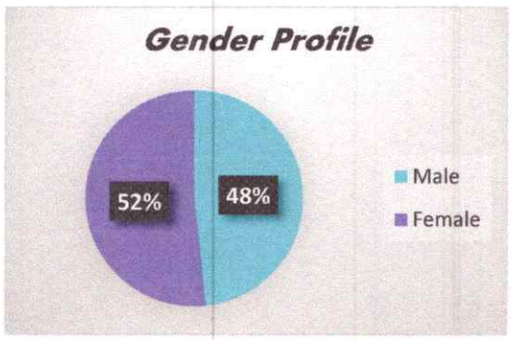

Figure 15. Gender Profile of Brgy. Bambanin

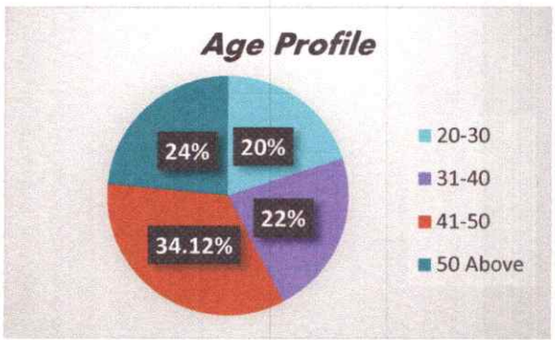

Figure 16. Age Profile of Brgy. Bambanin

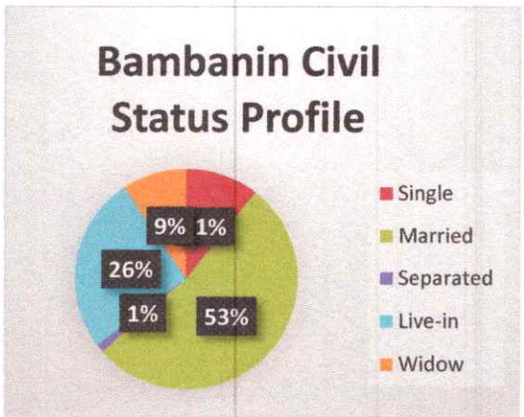

Figure 17. Civil Status of Brgy. Bambanin

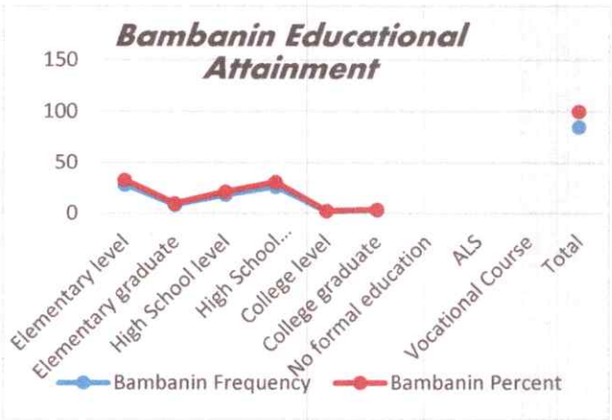

Figure 18. Educational Attainment of Bambanin

Figures 15, 16, 17 and 18 below show the socio-demographic profile of Barangay Bambanin. Figure 6 revealed that out of the 85 men and women respondents interviewed majority are female (52%), aged ranges from 41 to 50 years old (34.12%), and married (53%). In terms of educational attainment, Figure 9 shows that 9.41% finished primary education, 32.94% are elementary level, 30.59 % finished their secondary education and 3.53% of the respondents are college graduates.

1.2. Knowledge and Awareness on Peatland Ecosystem

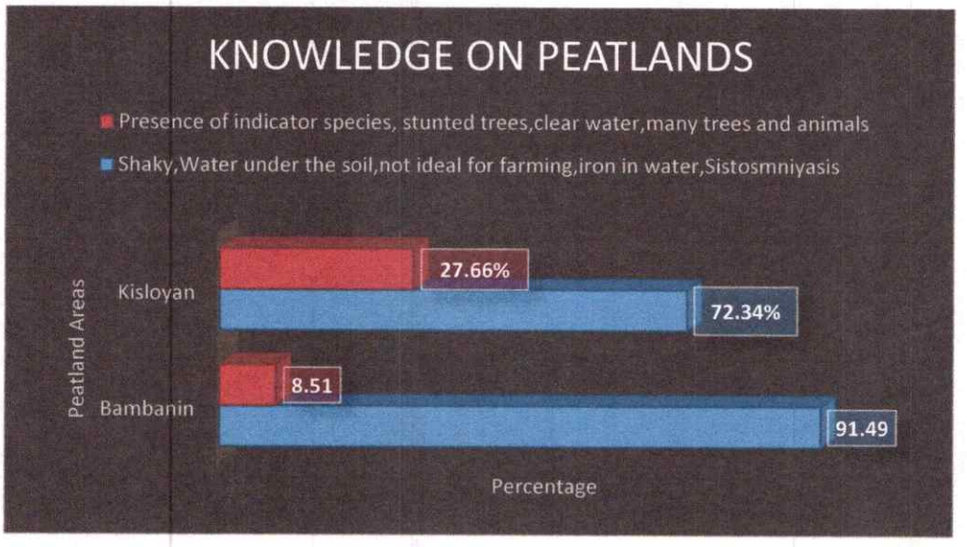

Figure 19. Awareness on the Presence of Peatlands

When the respondents in Kisloyan were asked about their knowledge and awareness of what a peatland is or if they noticed the presence of peatland in their area, 72.34% answered positively while 27.66% replied no idea at all. Figure 15. The majority (91.49%) who said they know what peatland is described it as (i) shaky with water underneath while few (8.51%) mentioned an area having the presence of indicator species, stunted trees, clear water, and many trees and animals are found inside

In terms of the knowledge of peatland, the answers of the respondents varied based on their observations or experiences and physical characteristics showed of the peatland. The majority (70.59%) of the respondents said they know what peatland is and described it as shaky with water underneath, iron in water, the soil is not suitable for farming and there is the presence of schistosomiasis.

1.3. On Importance of Peatland Ecosystem

Figure 20 below shows the perception of the locals on the importance of peatlands. Data revealed that in Barangay Villa Cerveza majority of the respondents answered positively (78.72%). While in Barangay Bambanin 40% answered positively, 2.35% answered otherwise and 57.65% has no idea at all. In addition, respondents answered that peatland provides plenty of services, these services are categorized into four namely: provisioning, regulatory, cultural, and supporting services.

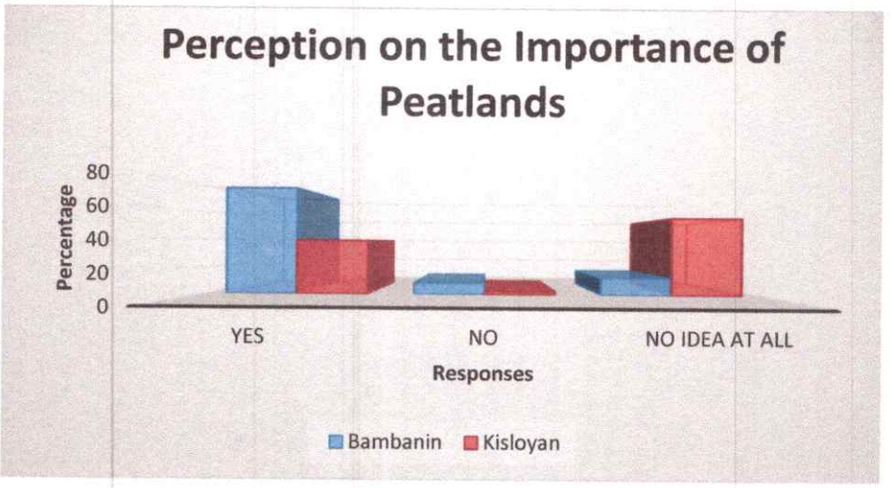

Figure 20. Perception on the Importance of Peatlands

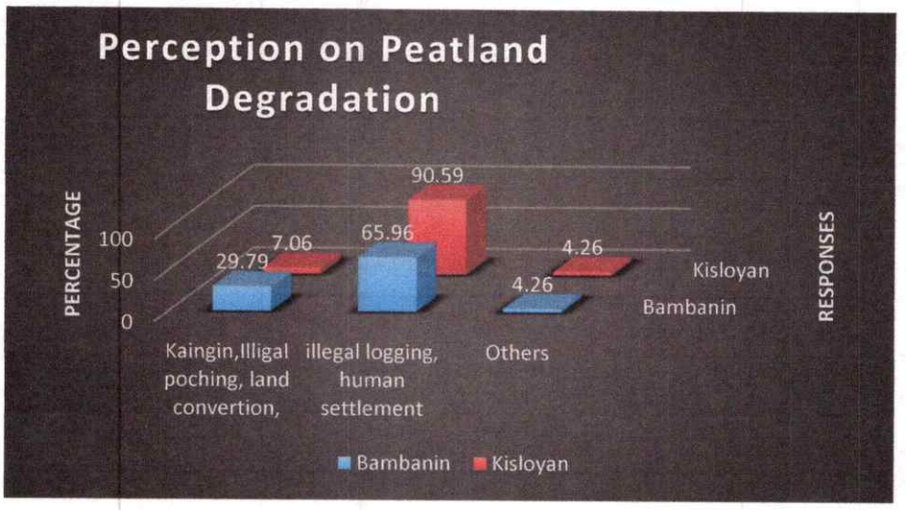

Figure 21. Perception on Peatland Degradation

Figure 21 above shows the perception of the locals on peatland degradation. In Barangay Bambanin, 65.96% said that peatland degradation is due to illegal logging and human settlement, 29.79% is caused by kaingin farming, and illegal poaching. While in Barangay Villa Cerveza, 90.59% believed that peatland degradation is caused by illegal logging and human settlement.

1.5 Occurrence of Peatland Fires

Peatland fires seldom happen in Bambanin Peatland. Figure 22 revealed 12.77% experience and witnessed the incidence of fire. They attributed this to kaingin activities that farmers are doing to clear the area for agricultural farming. Around 87.23% mentioned that they never experienced or witnessed any occurrence of peatland forest fires. While in Barangay Villa Cerveza, the majority (97.65%) of the respondents never experienced or witnessed the occurrence of peatland forest fires while only 2.35% answered otherwise. These results were supported by the FGD and KII conducted in the area last February 2022 in two peatland areas.

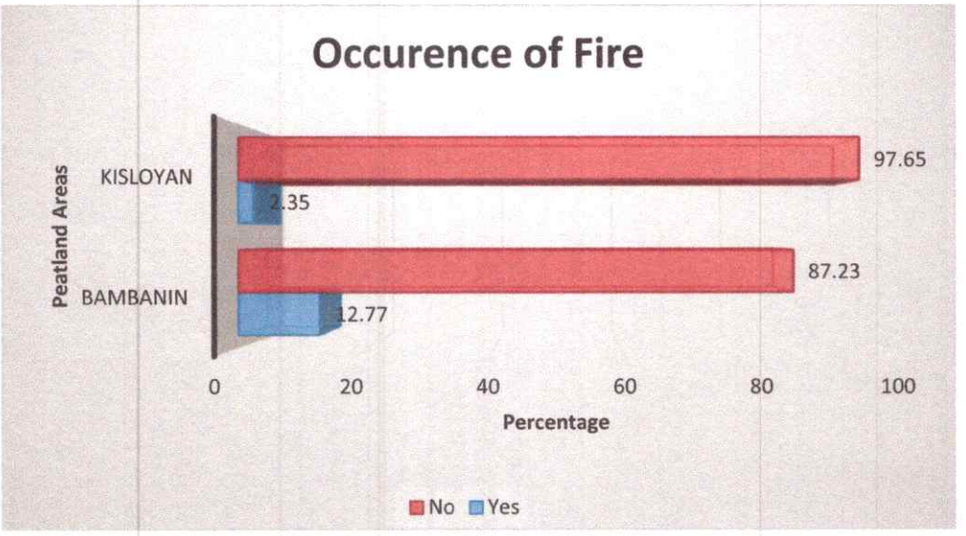

Figure 22. Occurrence of Peat Fires

1.6 Conduct of Information, Education and Communication Campaign

Figures 23 and 24 below revealed that in Barangay Villa Cerveza (83%) said that they are not aware of the IEC activities being conducted in their area. Only a few (15%) mentioned that they knew about peatland because there are IEC campaigns conducted by DENR through the distribution of posters and installed billboards near the peatland site. While (74.12%) of respondents in Barangay Bambanin are aware of the IEC Campaigns conducted in the area while 25.85% answered none. There are IEC distributions conducted in the area while 2.23% said that there are Information drives/Campaign also conducted and 15.18% mentioned that there are posters and billboards installed near the peatland site as the awareness campaign of DENR.

Respondent's answers on the IEC activities conducted in Kisloyan

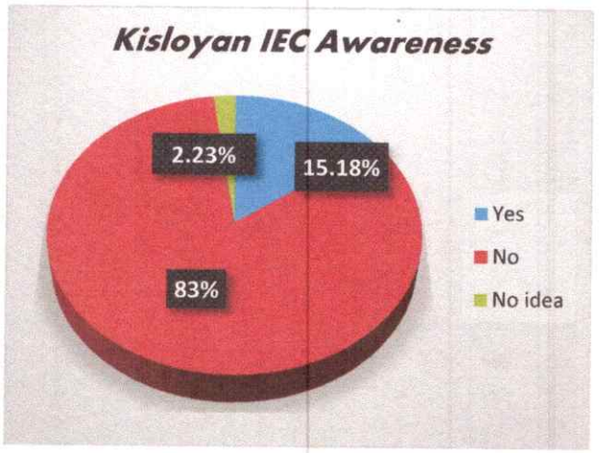

Figure 23. IEC Awareness in Brgy. Villa Cerveza

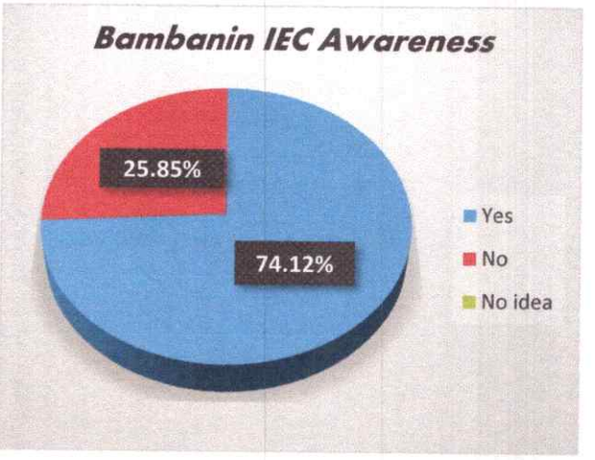

Figure 24. IEC Awareness in Brgy. Bambanin

- **FLORA ASSESSMENT**

Bambanin peatland is commonly known as "Bulaho" in Mindoro but accordingly, the area was commonly known as "Tambuhan" because of Tambo (*Phragmites australis* (L.) Linn.) the dominant species in the area decades ago before it was converted into other land use. Moreover, during the conduct of the assessment, there was a portion of the peatland was observed as an abandoned rice field. The species dominant in the area are sedges which are perennial plants commonly found in shallow water or moist soils. The listed vegetation was considered the least concerned based on the IUCN red list. Table 3 is the list of shrubs and grasses recorded from the area.

Kisloyan peatland comprises two portions/parcels with a total area of 37.70 hectares. Parcel A has an area of 27.14 hectares and it is considered a savannah ecosystem because the area was consisting of small vegetation which do not form a close canopy and allows sunlight to reach the ground. The recorded vegetations are sedges, broadleaves, fern, vines, shrubs, and palms. In parcel A, *E. dulcis* and *J. effusus* are the dominant species in plots 2, 3, 4, and 5 in plot 6, P. *tectorius* is the dominant species recorded during the assessment conducted. On the other hand, parcel B having a total area of 10.56 hectares is considered swamp peatland because shrubs and trees dominated the area. The vegetation dominant in the area are *A. setaceus, S. palustris and P. tectorius.* Moreover, *Vanilla planifolia* included in the endangered species based on the conservation category of IUCN is present in the area. The following graphs show the list of vegetation recorded during the assessment.

List of Vegetation Recorded from the Bambanin Peatland

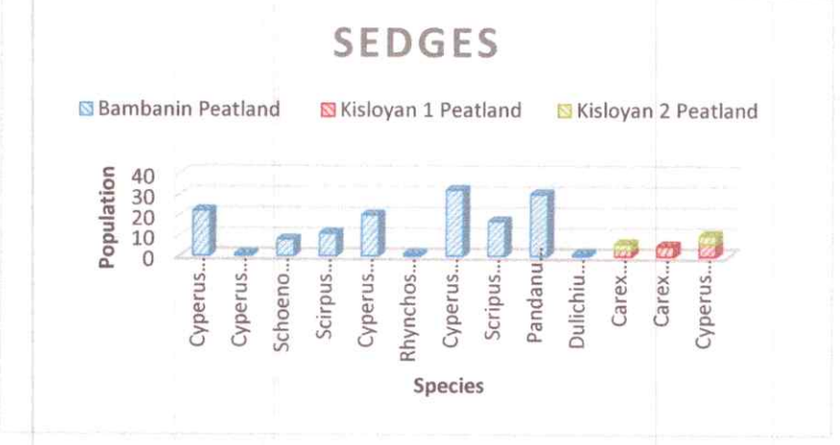

Figure 25. List of Sedges Identified

Abundance

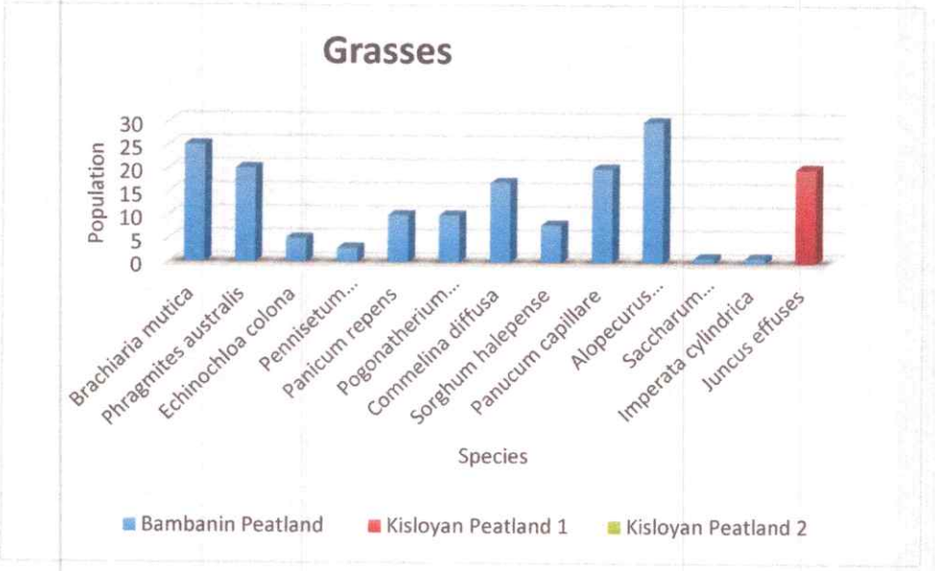

Figure 26. List of Grassess Identified

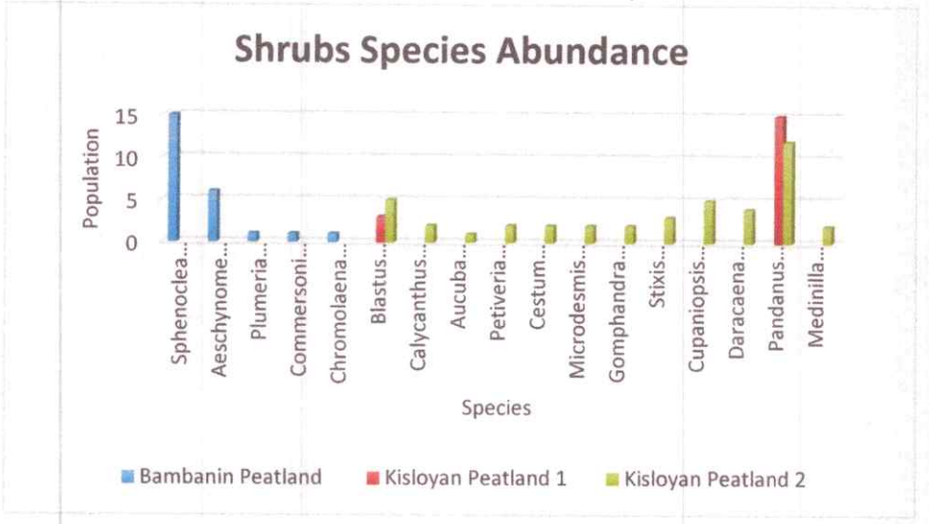

Figure 27. List of Shrubs Identified

Based on the Fernando biodiversity scale (1996), the computed H' of shrubs/grasses in the Bambanin Peatland was classified as very high, having a value of 3.611, and a high evenness category with an index value of 0.685. In terms of the diversity index, the data collected from the area revealed a high species diversity distribution using the Simpsons diversity index, with a value of 0.968. It indicates that the vegetation composition in the area is more diverse. The result indicates that ground

layer cover relative to grasses and shrubs is dependent on the light intensity that is important for the photosynthetic activity of the plants.

The conversion into other land use of the peatland contributed to the increase in diversity, composition, and richness. The computed H' of shrubs/grasses in the Kisloyan based on the Fernando biodiversity scale (1996) was classified as very high, having a value of 3.611, and has a high evenness category with an index value of 0.685. In terms of the diversity index, the data collected from the area revealed a high species diversity distribution using the Simpsons diversity index, with a value of 0.968. It indicates that the vegetation composition in the area is more diverse. The result indicates that ground layer cover relative to grasses and shrubs is dependent on the light intensity that is important for the photosynthetic activity of the plants.

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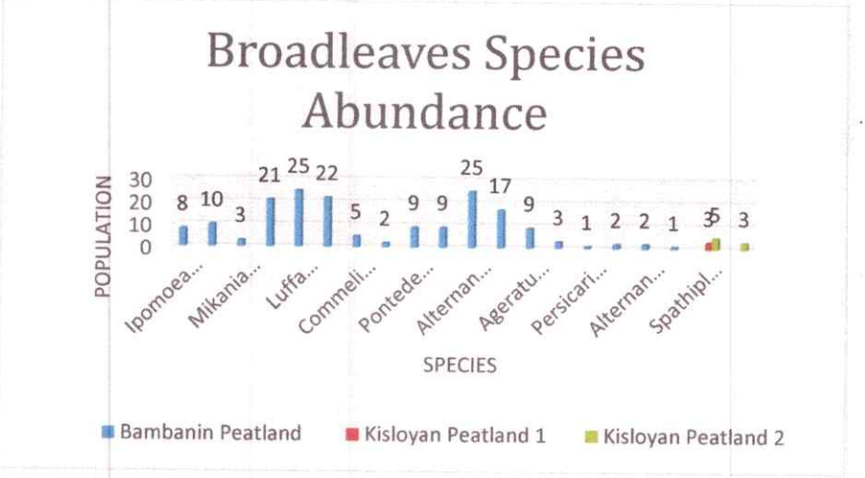


Figure 28. List of Broadleaves Identified

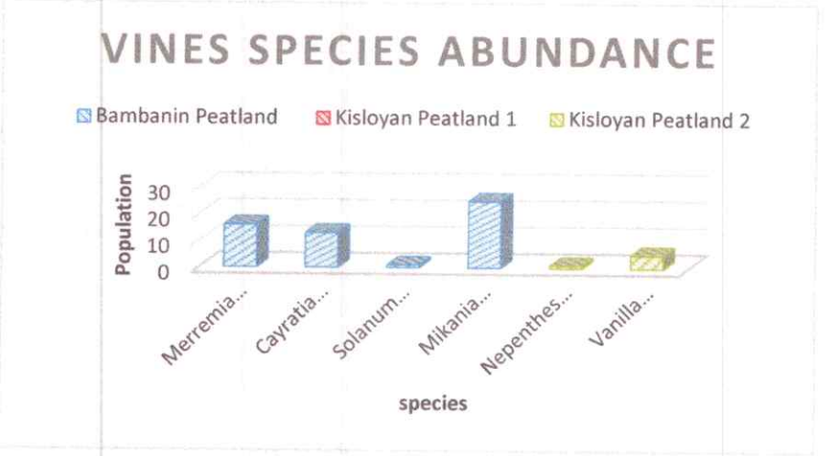


Figure 29. List of Vines Identified

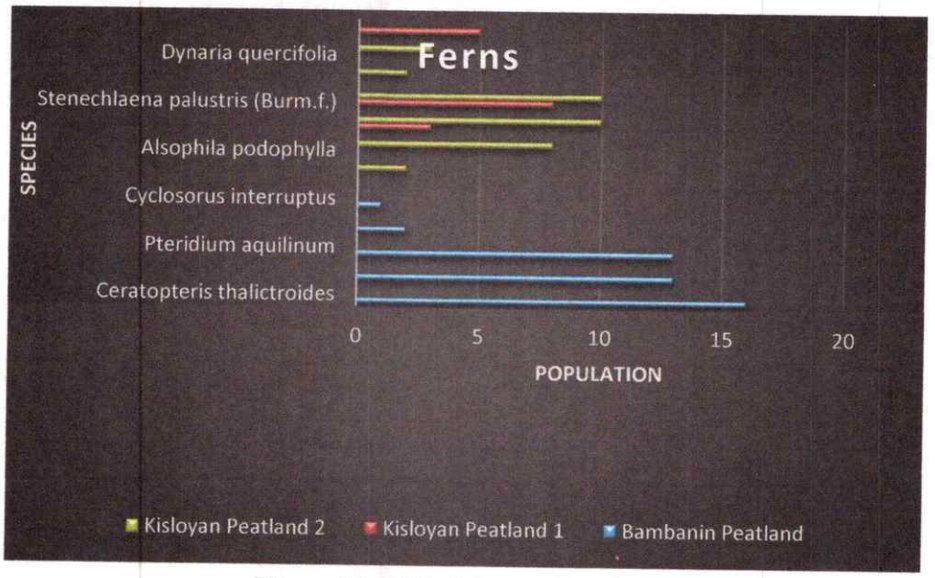


Figure 30. List of Ferns Identified

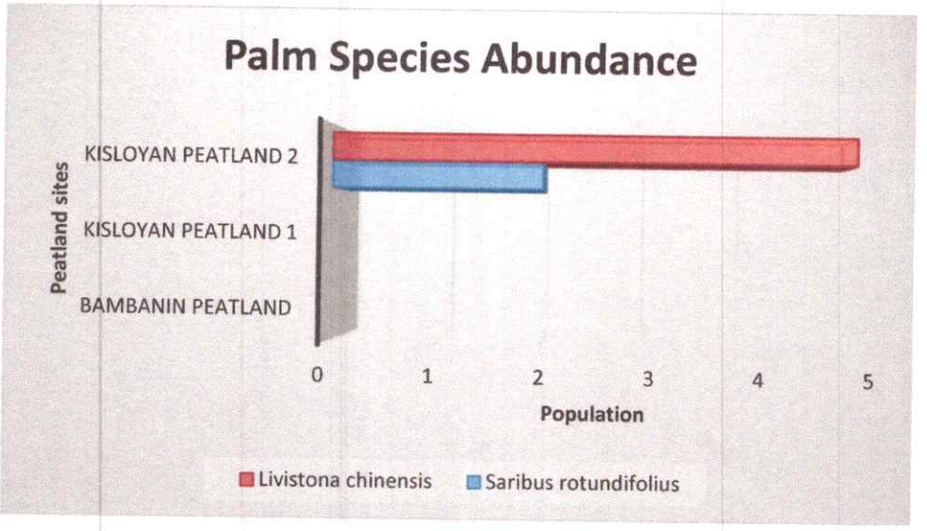


Figure 31. List of Palms Identified

There are 15 species belonging to different families such as Lecythidaceae, Myrtaceae, Dipterocarpaceae, Rubiacea, Rhizophoraceae, Corynocarpaceae, Melastomaceae, Magnoliaceae, Euphorbiaceae, Clusiaceae, Podocarpaceae, Sabiaceae, Annonaceae, Myristicaceae, and Meliaceae were observed and recorded. Putat and Syzygium species are observed dominantly in both areas. Nagi is recorded as near threatened and *M. yunnanensis* is recorded as critically endangered based on the conservation category listed in IUCN.

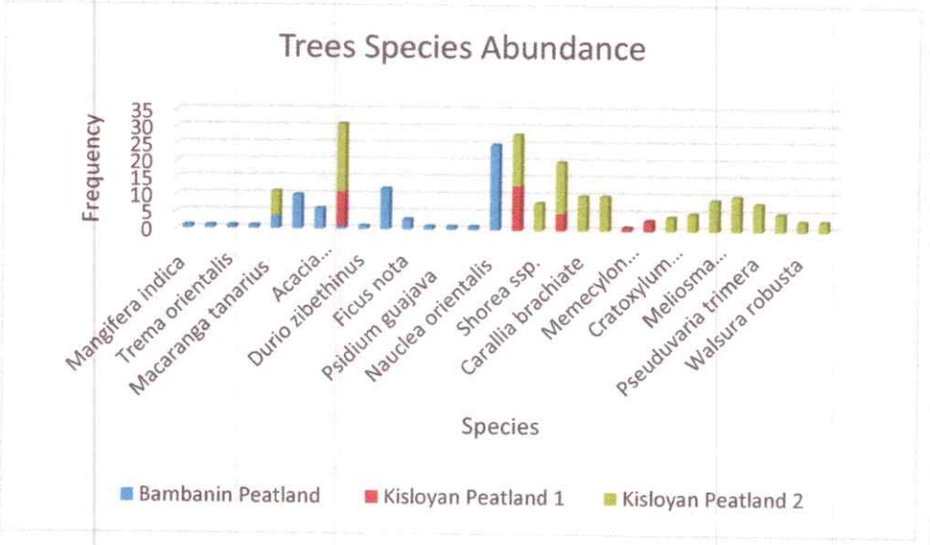


Figure 32. List of Treee Species Abundance

Figure 32 shows the list and abundance of forest tree species in three (3) peatland sites. Data shows that in Bambanin peatland the dominant species is Bangkal (*Nauclea orientalis*) however, from the previous assessment conducted under the study; Development of Management Strategies for Peatlands, Lanipau (*Terminalia copelandii* Elmer) was reported as the dominant tree species associated by other species such as bangkal (*Nauclea orientalis* (L.)), putat (*Barringtonia racemosa* (L.) *Blume ex* DC.), Mangium (*Acacia mangium* Wild.), Binunga (*Macaranga tanarius* (L) Muell.-Arg), and Mangga (*Mangifera indica* Linn.). The decreasing number of forest tree species in Bambanin peatland is caused by land conversion and anthropogenic activities.

Based on the diversity index result, the computed H' of the vegetation on parcels in Kisloyan A and B were classified as low to high having a value of 2.139 and 3.04 respectively. The evenness result revealed that both areas were categorized as very high with an index value of 0.772 and 0.804. In terms of the diversity index, the data collected from parcel A and B areas revealed a high species diversity distribution using the Simpsons diversity index. With the value of 0.885 and 0.942, it indicates that vegetation composition is diverse in both.

The diversity index result for the forest trees on Kisloyan peatland was classified as very low to moderate based on the computed result of Shannon index H' which is 1.35 for parcel 1 and 2.571 for parcel 2. In terms of evenness, both parcels were categorized as very high with a value of 0.771 and 0.872. The

species distribution which was computed using the Simpson dominance indicates a moderate to high index with a value of 0.703 and 0.914 for the parcel A and parcel B areas respectively.

The vegetation composition and classification of Bambanin and Kisloyan Peatland are not the same. The Bambanin peatland is dominated by vegetation types such as grasses, broadleaves, vines, ferns, and sedges of which Bangkal, Tambo, Paragrass, and some sedges were observed to dominate in the area. As stated in the published study of Putri, Rizky, Istyadji, Maya, Hayati, and Farida 2019 on the use of Bangkal trees *(Nuaclea sp)* in their perspective of wetland ethnics, bangkal trees adapt well to the swamp ecosystems, peatland, forest along flowing rivers and flooded area similar to the condition of Bambanin. On the other hand, Kisloyan peatland comprises two portions belonging to different types of ecosystems, parcel A which is considered a savannah while the second is a swamp ecosystem. Parcel A is almost covered with grasses namely common rush. *J. effusus* (common rush), is an obligate wetland species and it grows in a wide range of freshwater wetland habitats including marshes, swamps, wet pastures, and ditches primarily where water stands for only part of the year (Adamson, 1935, Haet-Ahti, 1980, Balslev, 1996 Weakley 2016). However, parcel B considered swamp peatland is more or less submerged in water, and a dense forest cover was observed with putat and syzygium ssp. as the dominant species with the understorey vegetation of ground flora such as *P. tectorius*, ferns, and shrubs.

In addition, there are some species in Bambanin peatland that needs to be verified. In 2016 study of Dr. Pasicolan there are species identified that grows from another country and which Bambanin peatland adapted, hence for verification.

- **FAUNA ASSESSMENT**

Twenty (21) species were observed, belonging to fourteen (14) families of avifauna, and out of these 21 species, a total of 156 number of individuals were observed, for other fauna two (2) Amphibian species, and one (1) Mollusks & twenty-one (21) Leeches observed in both Bambanin and Kisloyan peatland as shown in the graph below. The assessment conducted showed that Bambanin peatland had the highest/abundance in species count in

avifauna compared to Kisloyan peatland. The abundant species observed were Whiskered tern (*Chlidonias hybrida)* under the family Laridae followed by Brahminy Kite (*Haliastur indus)* under the family Accipitridae.

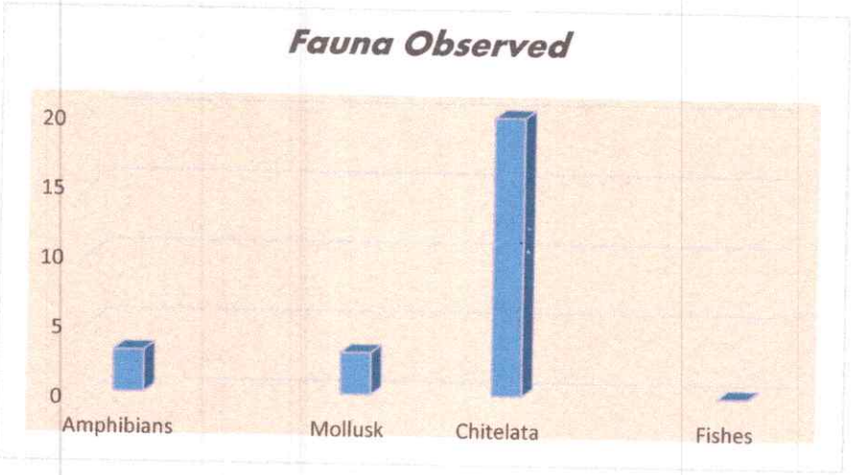


Figure 33. Fauna Observed in Kisloyan Peatland

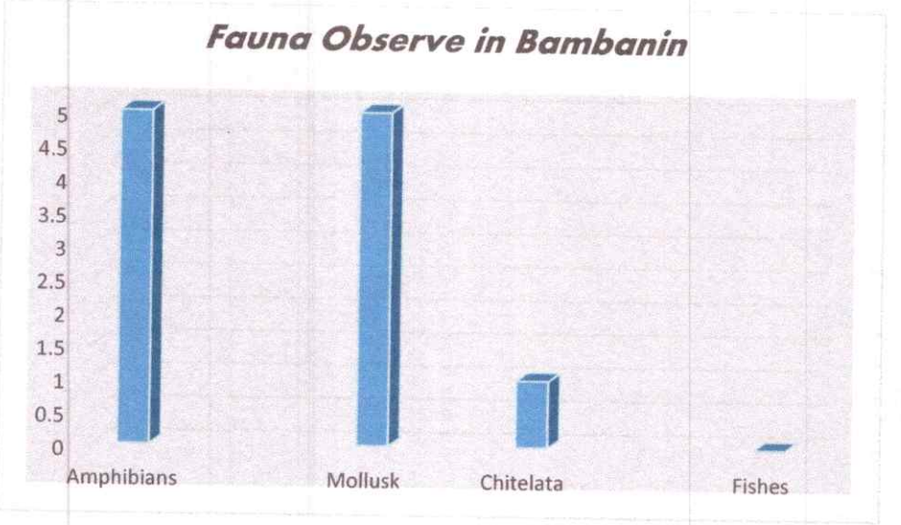


Figure 34. Fauna Observed in Bambaniņ Peatland

Eurasian tree sparrow (*Passer montanus)* under the family of Passeridae and Philippine bulbul (*Hypsipetes philippinus)* of the family Pycnonotidae respectively. In addition, Philippine coucal (*Centropus viridis)* under the family of Cuculidae which is endemic to Mindoro was also spotted/documented in the area. As per interviews with the Mangyan folks of Kisloyan, accordingly, fishes like hito/halluan, dalag, ibis, paitan & kasili can also be found in the area.

Figure 35 below shows the species richness of avifauna in Bambanin and Kisloyan Peatland. The data represents a simple count of the number of species in a given sample areas as a measure of species richness within the two (2) observation sites of Bambanin and Kisloyan peatland. In Bambanin peatland the Chlidonias hybrida had the highest individual species count of 35 while in Kisloyan Peatland, the highest species count Treron curvirostra with 20 species counts.

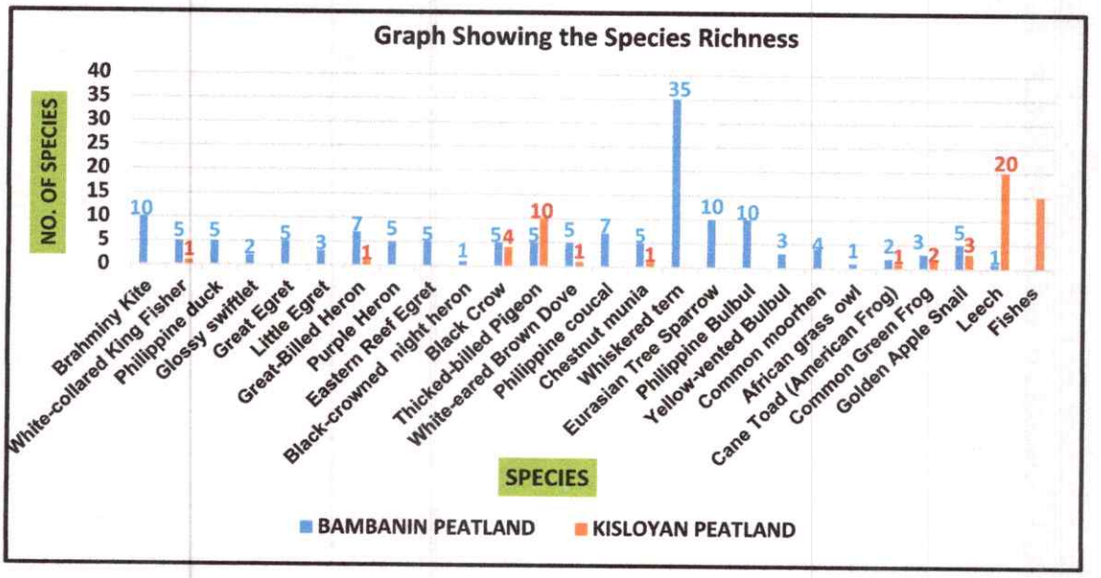


Figure 35. Avifauna Species

In Calculating diversity indices, for determining the number and abundance of the species distributed in the two (2) peatlands of Bambanin and Kisloyan. The computation of Index of diversity, evenness, and dominance using **Past 4.03 Software**.

Table 7. Showing the Diversity Indices

DIVERSITY INDICES	BAMBANIN PEATLAND	KISLOYAN PEATLAND
• **Taxa**	21	6
• **Individuals**	138	18
• **Dominance_D**	0.09914	0.3704
• **Simpson_1-D**	0.9009	0.6296
• **Shannon_H**	2.075	1.303
• **Evenness_e^H/S**	0.7119	0.6134

- **MACRO-FUNGAL ASSESSMENT**

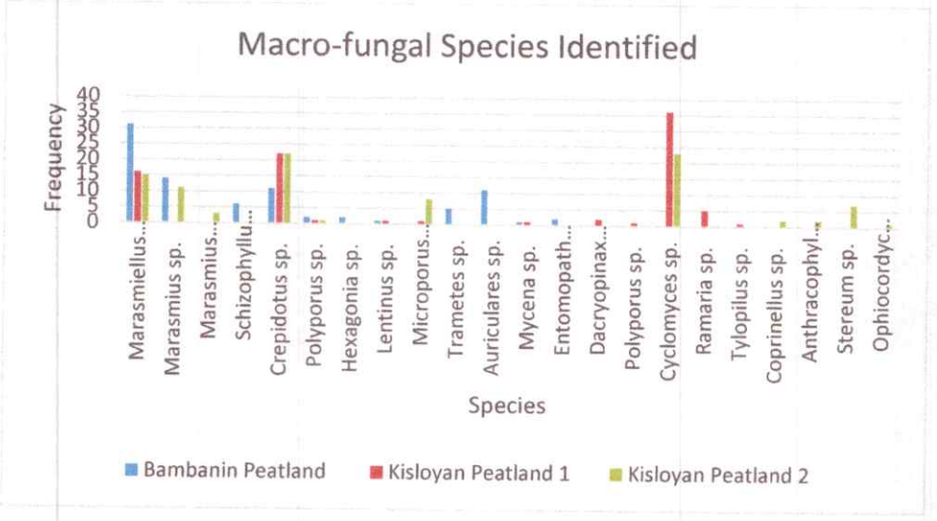


Figure 36. Macrofungal

Figure 36 above shows the list and abundance of macrofungal in three peatland areas. In Bambanin peatland, a total of 11 species of fungal organisms were recorded belonging to 7 families under the basidiomycetes group. Based on the result, the highest number of species was observed in *Marasmiellus sp.* under the family Marasmiaceae. Further, the family Polyporaceae shows 3 species of macro-fungi followed by Maramiaceae & Coriolaceae with 2 species within the area, and the other families were observed only with 1 species. The identified macro-fungal organism was observed on dead branches and litter that are decomposing within the site. Furthermore, an entomopathogenic fungus was observed in the area infecting an insect under the order Blattodea.

In Kisloyan (Area 1) peatland, a total of 8 species of fungal organisms were recorded belonging to 8 families under the basidiomycetes group. Based on the result, the highest number of species was observed in *Crepidotus sp.* under the family Crepidotaceae. Further, the Polyporaceae family was observed with 2 species within the area and the other families were observed only with 1 species. The identified macro-fungal organism was observed on dead branches and litter that are decomposing within the site. While Kisloyan peatland (Area 2) recorded a total of 10 species of fungal organisms belonging to 8 families under the basidiomycetes and ascomycete groups. Based on the result, the highest number of species was observed in *Cyclomyces sp.* under the family Hymenochaetaceae. Further, families under

Maramiaceae, & Polyporaceae, were observed with 2 species within the area and the other families were observed with only 1 species.

Diversity indices of the macro-fungal organism in Bambanin and Kisloyan (Area A&B) Peatland

Based on the diversity indices in all peatland sites, the Shannon H diversity index was observed in Babanin and Kisloyan (parcel A and B) with 1.907, 1.492 & 1.944 respectively. For evenness, high classification was observed in Bambanin and Kisloyan (parcel B) with 0.6118 & 0.6989 respectively while Kisloyan Area A falls under moderate classification. In terms of Simson dominance, Bambanin, and Kisloyan (parcel B) peatland show a high degree of diversity with 0.8007 and 0.8309, respectively while Kisloyan (parcel A) shows a moderately high degree of diversity with 0.7136.

ARTHROPODS ASSESSMENT

Based on the identification results, there are 11 orders found, namely: Araneae (spiders), Odonata (dragonflies and damselflies), Coleoptera (beetles), Lepidoptera (skipper, moth and butterfly), Diptera (true flies), Hemiptera (true bugs and hoppers), Orthoptera (grasshopper), Phasmatodea (walking stick), Neuroptera (mantisfly & ant lion), Hymenoptera (ants, bees and wasps) and Blattodea (cockroach). The distribution of 45 taxa recorded in three sites is presented in the graph below

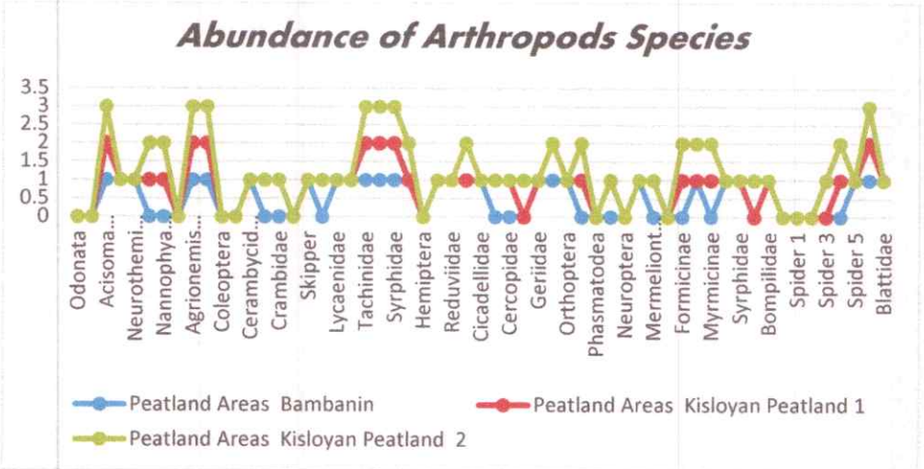


Figure 37. Arthropods Abundance

Notable identification results highlight the observed presence of the dragonfly species, *Nannophya pygmea* which is known as the smallest dragonfly in the world. *N.pygmea* is an endangered species native in Southeast Asia and occasionally found in Australia.

Abundance

A total of 314 individuals were observed/collected during the assessment. Among the observed taxa, the family Chrysomelidae exhibited very high abundance with 114 individuals found in Bambanin peatland. It is then followed by *Agrionemis pygmea* which is moderately abundant with a total of 26 individuals observed in 3 peatlands. Meanwhile, *Oxyopes sp.* is also moderately abundant with 24 individuals observed only in Kisloyan 1 and Kisloyan 2.

The abundance of these arthropods is maybe associated with the composition/diversity of other fauna or flora in the three peatlands. Nonetheless, the computation of diversity indices to evaluate the diversity of plants and arthropod fauna within the peatland ecosystem will be done. The following biodiversity parameters will be considered:

Species richness. Species richness may refer to the actual number of species as a direct measurement. Species diversity. Shannon's index of diversity (H') measures the average degree of 'uncertainty" in predicting to what species an individual chosen at random from a collection of S species and N individuals belongs. Shannon's index of diversity was computed using the formula:

$$H' = -\{(ni/n)\ln (ni/n)\}$$

Where:

n_i = the number of individuals belonging to the i^{th} of S of species in the sample

n = the total number of individuals in the sample

Index of similarity (S). The Bray Curtis index of similarity (S) is a clustering analysis measure of the degree to which the species composition is alike or different between and among the established plot.

- **SOIL CHARACTERIZATION -PHYSICAL AND MORPHOLOGICAL PROPERTIES**

Bambanin, Victoria, Oriental Mindoro

The active soil depth of Bambanin was measured directly from an auger with extender bored into the soil which ranges from 60 cm to >200 cm. Accordingly, decades ago, the dominant species planted in the area was Tambo (*Phragmites australis* (L.) Linn.) and was recently converted into other land use such as agricultural land associated with patches of emergent forest species. Undecomposed wood particles, roots, and leaves in the soil were observed especially in the 0-15cm depth of the area. However, since plots 1 to 3 were disturbed and converted to agricultural use, it would be difficult to observe the exact soil formation of the area.

Soil monolith taken from the area which represent the soil vertical formation within the area of Bambanin showed a very dark gray (10YR3/1) to dark brown (10YR3/3) soil color for plots 1-3 (FIGURE 36). Such areas were considered as disturbed areas as it is converted to agricultural use. It is a clay loam soil with distinct mottles and discolorations in the solum which is a characteristic of soils

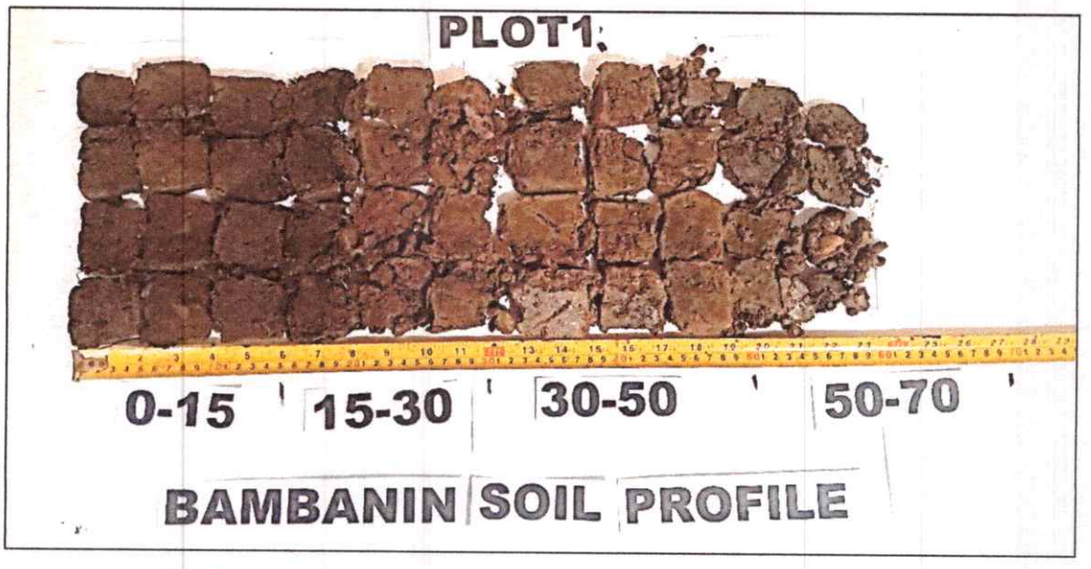


Figure 38. Soil monolith for plot 1 of Bambanin Peatland, Oriental Mindoro

s

were the dominant vegetation. Organic debris as in roots of the vegetation still reaches >1 meter since the area is not yet converted to agricultural use due to the depth of water submergence and can be classified as sapric peat. It is a black (10YR2/1-

7.5YR2/1) in soil color. The presence of fibrous roots in the 0-30 cm is very evident (FIGURE 38), then mixture of fibric and sapric horizon of soil can be observed in the 30-90 cm of the soil. Beyond is a mixture of sapric and hemic horizons were mostly were submerged in water.

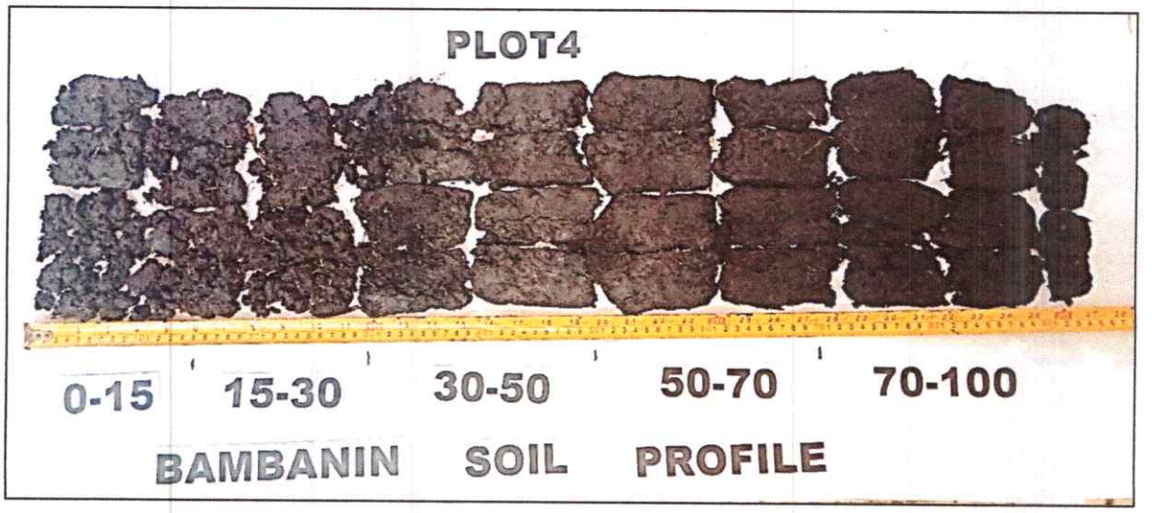


Figure 39. Soil monolith for plot 4 of Bambanin Peatland, Oriental Mindoro

Table 8 showed the characteristics of the soil organic materials according to the degree of decomposition based on Soil Survey Staff (1975 and 2014).

Table 8. Characteristics of organic materials according to their degree of decomposition (Source: Soil Survey Staff 1975 and 2014).

CHARACTERISTICS	FIBRIC	HEMIC	SAPRIC
Bulk density	<0.1	0.07 - 0.18	>0.2
Fibre content	2/3% by vol before rubbing; 3/4% by volume after rubbing	1/3 - 2/4% before rubbing	<1/3% by volume before rubbing
Saturated water content as percent of oven-dry material	850 - >3,000	450 - >850	<450
Color	Light yellowish brown or reddish brown	Dark grayish brown to dark reddish brown	Very dark gray to black

Saprists are Histosols that are either saturated with water for 6 months or more of the year, or have artificial drainage and satisfy the following: (1) Sapric materials dominant in the organic part of the control section if mineral layer(s) 40 cm or more thick have an upper boundary in the subsurface tier; (2) Or have sapric materials dominant in the subsurface tier if no continuous mineral layer 40 cm or more thick has its upper boundary in that tier; and (3) Have no sulphuric horizon with its upper boundary within the upper 50 cm or sulphidic materials within 1 m depth.

Kisloyan Parcel 1 and 2

On the other hand, Kisloyan Parcels 1 at So. Kisloyan, Barangay Villa Cerveza, Socorro, Oriental Mindoro is a basin-type peatland and can be classified as Fen or Geogenous mire since the peatland is situated in a depression and receives water that has been in contact with mineral bedrock or soil and surface water. This is eminent in the actual location of the Peatland area, surrounded by mountains. Bog peatlands are nutrient-deficient systems and important carbon (C) sinks yet the stoichiometry of nitrogen (N), phosphorus (P) and potassium (K), essential for plant growth and decomposition, has rarely been studied. Active soil depth ranges from 95 cm to >200cm. Small sedges were the prominent vegetation in the area with numerous fibrous roots reaching more than 1 meter in depth. Soil color ranges from black (10YR2/1) to very dark gray (10YR3/1). The soil monolith (FIGURE 39) showed a fibrist type of soil, where 2/3% by vol before rubbing; 3/4% by volume decreases after rubbing of its fiber content. Since Kisloyan Parcel 1 is a fen type fibrist peat totally submerge in water, where only 0-70 cm of the fibrist materials can be sampled in the area.

Figure 40. Soil monolith for Parcel 1 of Kisloyan, Barangay Villa Cerveza Oriental Mindoro

While Kisloyan Parcel 2 is a mixture of the fibric, sapric and hemic types of soil (FIGURE 40). It is semi disturbed in the surface due to the influx of human activity more on fishing and hunting. The 0-15 cm portion of the horizon showed a very dark grayish brown (10YR3/2) soil color which gradually change to dark gray brown (10yr4/4) from 15-28 cm and abruptly change to brownish yellow (10YR6/6) in between 28-33 cm and settles back to very dark brown (10YR2/2) to dark yellowish brown (10YR4/6) in the 54-58 cm. The variation of colors in the soil solum indicates disturbance on the surface and the changes of the submergence and decomposition of the soil brought about by the aerobic and anaerobic condition of the area.

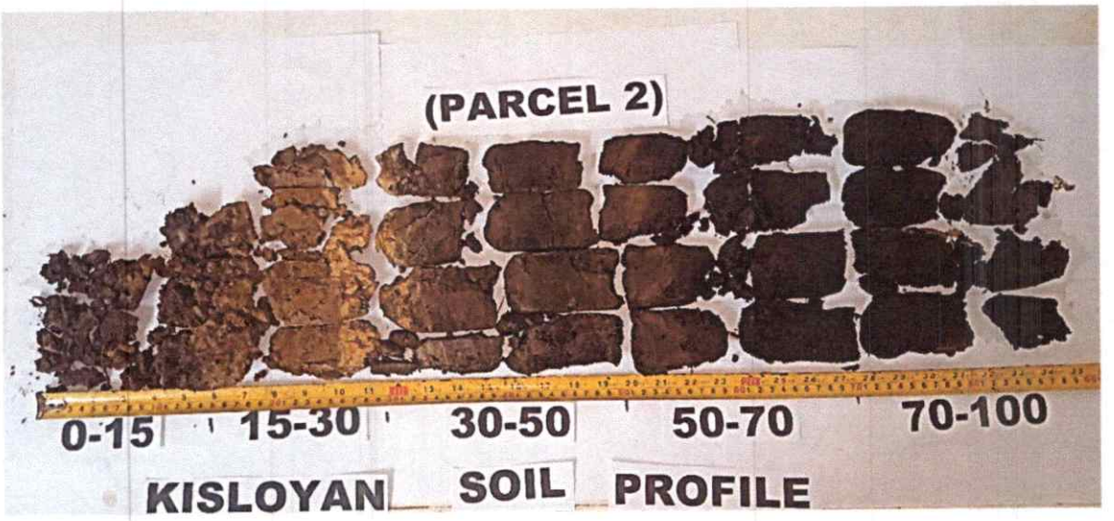


Figure 41. Soil monolith for Parcel 2 of Kisloyan, Barangay Villa Cerveza Oriental Mindoro

classified based on (1) hue, (2) value, and (3) chroma using the Munsell color chart (Munsell Color, 2010). Hue is the overall color of the soil, such as red or yellow. Value is the lightness or darkness of the soil color and chroma is the intensity or greyness of color. Hydric soils typically have a chroma of 2 or less, which indicates anaerobic conditions and long-term inundation or saturation. Iron (Fe) and manganese (Mn) play important roles in the color of wetland soils and the formation of redoximorphic features (Mobilian and Craft, 2021).

• SOIL CHARACTERIZATION - CHEMICAL PROPERTIES

Bambanin, Victoria, Oriental Mindoro

Table 9 presents the average soil test values of soil samples from Bambanin, Victoria, Oriental Mindoro. Result showed that soil samples from

Table 9. Average soil values of soil samples from Bambanin, Victoria Oriental Mindoro taken dated April 4-14, 2022

Sample No.	Description	SOIL TEST RESULTS									
		pH**	N ***	Avail. P * (ppm)	Exch K. * (me/100g)	OM ** (%)	SOC *** (%)	BD** (g/cm3)	SOC kgC/Ha	SOC tC/Ha	C/N Ratio
PLOT 1	converted	5.42	0.24	> 4 (VL)	0.3-0.5 (L)	4.82	2.80	1.11	9,621.74	9.62	11.63
PLOT 2	swampy/ submerge	5.10	1.36	> 4 (VL)	0.3-0.5 (L)	27.25	15.84	1.12	51,125.19	51.13	11.63
PLOT 3	partly converted/ swampy	5.16	1.15	> 4 (VL)	0.3-0.5 (L)	23.09	13.43	1.04	41,139.03	41.14	11.63
PLOT 4	grassland/ undisturbed	5.37	1.67	> 4 (VL)	0.3-0.5 (L)	33.35	19.39	0.95	55,954.85	55.95	11.63
PLOT 5	grassland/ undisturbed	5.13	1.42	> 4 (VL)	0.3-0.5 (L)	28.44	16.54	1.04	51,572.01	51.57	11.63
PLOT 6	grassland/ swampy	5.20	1.87	> 4 (VL)	0.3-0.5 (L)	37.34	21.71	0.94	60,385.41	60.39	11.63
Mineral Soil	Mineral sample	5.80	0.23	> 4 (VL)	0.3-0.5 (L)	4.54	2.64	1.00	7,919.84	7.92	11.63

- ** STK Analysis*
- *** Qualitative Analysis*
- **** Conversion factor*

Bambanin has a pH range of 5.10-5.80 which is categorized as moderately acidic. Soil pH generally denotes the degree of soil acidity or alkalinity of a sample (USDA-NCRS 2011, Hills Laboratories 2016 and Horneck et al 2011). It is defined as the $\log^{10}$ hydrogen ions (H^+) in the soil solution. The pH scale ranges from 0 to 14; a pH of 7 is considered neutral. If pH values are greater than 7, the solution is considered basic or alkaline; if they are below 7, the solution is acidic (USDA-NCRS 2011; Brady 1974). Soil acidity test is important because of how it influences the chemical and physiological processes in the soil, and the availability of plant nutrients (Hills Laboratories 2016).

Since plot 1 is a disturbed and converted area, the organic matter content is LOW (4.82%) which is comparable to the mineral soil sampled adjacent to the site with OM of 4.54%. Plots 2 to 5 as shown in table 9 showed a HIGH Organic Matter values ranging from 27.25%-37.34% and soil organic carbon ranging from 15.84%-21.71%. The C:N ratio of 11.63 qualifies to the MEDIUM range as shown in table 10 which falls within the normal range (10-12) for an arable soil with good rate of organic matter decomposition. The organic matter and soil organic carbon value qualifies to the classification of Bambanin as peatland. However, the conversion of the site into agricultural and residential areas poses a great risk to the status of the peatland condition in the area. Draining peatlands to create agricultural land oxidizes the soil and releases large amounts of carbon dioxide into the atmosphere (Vaidyanathan, 2011) and damages the peatland ecosystems.

Table 10. Soil test categories based on various ranges

PARAMETERS	RANGE				
	VERY LOW	LOW	MEDIUM	HIGH	VERY HIGH
Soil pH[a]	<4.5	4.5 - 5.0	5.1 - 5.5	5.6 - 6.0	>6.0
Organic Matter	<3	3 - 7	7 - 17	17 - 35	>35
Nitrogen (%)[a]	<0.1	0.1 - 0.2	0.2 - 0.5	0.5 - 1.0	>1.0
Phosphorus (ppm)[b]	0 - 3	4 - 7	8 - 13	14 -22	>23
Potassium (ppm)[b]	< 70	70 - 150	150 - 250	250 - 350	> 350
Organic Carbon	<2	2 - 4	4 - 10	10 - 20	>20
C/N Ratio[a]	<8	8-10	10 - 15	15 - 25	>25

[a]Hills Laboratories (2016); [b]Bolsa Analytical (2016)

Kisloyan Parcel 1 and 2

Kisloyan Parcels 1 at So. Kisloyan, Barangay Villa Cerveza, Socorro, Oriental Mindoro - a basin-type peatland has a pH range of 5.33 to 5.80 still classified as moderately acidic. Plot 1 and 6 which is located in the forested boundary of the basin type peatland has a LOW OM content of 3.33% and 5. 18% which is equivalent to a mineral soil (table 11). However, plot 2-5 showed a very high organic matter content ranging from 33.80% to 73.57% with soil organic carbon ranging from 19.65% to 42.77% which qualifies the site as fen peatland. According to Joosten (2003), peatlands were historically distinguished on the basis of their situation and the after-use of the remaining land, leading to the identification of bogs and fens. Bogs are raised above the surrounding landscape where after peat extraction, which was normally carried out under dry conditions following drainage, a mineral subsoil suitable for agriculture often remained while fens are situated in depressions. After peat extraction, which was carried out by dredging, open water remained. All water on land ultimately originates from rain and other forms of atmospheric precipitation. Precipitation water is poor in nutrients and acidic.

Table 11. Average soil test values of soil samples from Kisloyan-Parcel 1, Socorro, Oriental Mindoro taken dated April 4-14, 2022.

Sample No.	Description	SOIL TEST RESULTS									
		pH **	N ***	Avail. P * (ppm)	Exch K. * (me/100g)	OM ** (%)	SOC *** (%)	BD ** (g/cm3)	SOC kgC/Ha	SOC tC/Ha	C/N Ratio
PLOT 1	silty clay/ boundary	5.60	0.17	> 4 (VL)	0.3-0.5 (L)	3.33	1.93	1.04	6,233.09	6.23	11.63
PLOT 2	grassland / fibrous	5.80	3.47	> 4 (VL)	0.3-0.5 (L)	69.34	40.31	0.61	74,895.19	74.90	11.63
PLOT 3	grassland / fibrous	5.80	3.68	> 4 (VL)	0.3-0.5 (L)	73.57	42.77	0.43	54,970.58	54.97	11.63
PLOT 4	grassland / fibrous	5.33	2.86	> 4 (VL)	0.3-0.5 (L)	57.24	33.28	0.43	42,932.81	42.93	11.63
PLOT 5	grassland / fibrous	5.80	1.69	> 4 (VL)	0.3-0.5 (L)	33.80	19.65	0.86	50,503.35	50.50	11.63

PLOT 6	forested/ boundary	5.60	0.26	> 4 (VL)	0.3-0.5 (L)	5.18	3.01	1.63	14,928.59	14.93	11.63

- * *STK Analysis*
- ** *Qualitative Analysis*
- *** *Conversion factor*

As to Kisloyan Parcels 2 at So. Kisloyan, Barangay Villa Cerveza, Socorro, Oriental Mindoro, the area is more forested than Kisloyan Parcel 1. The pH of the area is still moderately acidic with pH range of 5.10 to 5.67 (table 12). Organic matter content is also very high ranging from 30.71% to 42.15% with equivalent SOC of 17.85% to 24.51%. Kisloyan Parcel 2 qualifies as bogs peatland. Bogs are raised above the surrounding landscape where after peat extraction, which was normally carried out under dry conditions following drainage, a mineral subsoil suitable for agriculture often remained

Table 12. Average soil test values of soil samples from Kisloyan-Parcel 2, Socorro, Oriental Mindoro taken dated April 4-14, 2022

Sample No.	Description	SOIL TEST RESULTS								
		pH **	N ***	Avail. P * (ppm)	Exch K. * (me/100g)	OM ** (%)	SOC *** (%)	BD ** (g/cm3)	SOC kgC/Ha	SOC tC/Ha
PLOT 1	forested	5.67	1.54	> 4 (VL)	0.3-0.5 (L)	30.71	17.85	1.35	71,572.51	71.57
PLOT 2	forested	5.40	2.03	> 4 (VL)	0.3-0.5 (L)	40.70	23.66	1.05	75,196.60	75.20
PLOT 3	forested	5.13	2.11	> 4 (VL)	0.3-0.5 (L)	42.15	24.51	1.05	77,612.18	77.61
PLOT 4	forested	5.10	1.81	> 4 (VL)	0.3-0.5 (L)	36.25	21.07	1.09	68,460.87	68.46

- * *STK Analysis*
- ** *Qualitative Analysis*
- *** *Conversion factor*

• WATER COLLECTION AND ANALYSIS

The Bambanin Peatland waters are categorized as a classified C water body. Based on the water analysis conducted by the DENR-EMB Calapan Laboratory, the surface water in Bambanin stations has an average pH of 7.15 which is considered alkaline. The amount of chloride in water is within the standard limit based on the DENR-DAO Standard. Likewise, the Total Suspended Solids (TSS), or the amount of particulate matter suspended in water in the three stations contained an average amount of 36.6mg/L which is within the standard level. In terms of Dissolved Oxygen (DO), stations 1 and 2 are within the tolerable limits but station 3 showed a lower DO of 3.8mg/L. This means that the water has less dissolved oxygen to sustain aerobic life forms and is a threat to water quality. This may cause by higher water temperature or algal bloom. The Biological Oxygen Demand (BOD) is the amount of oxygen consumed by bacteria and other microorganisms while decomposing organic matter under aerobic conditions. The amount of BOD in this area indicates moderate healthy water which has a result of <3. The higher the BOD the higher Oxygen is required. For coliform count, the result showed a higher number of bacteria in the water that is not within the standard level or with contaminants as shown in the table below.

Table 13. Result of surface water analysis taken in 3 established stations at Bambanin Peatland dated April 7, 2022 undertaken by DENR-EMB-Calapan, Oriental Mindoro

Station.	Location	PARAMETERS						
		pH	Chloride	Color	TSS	DO	BOD	Fecal Coliforms
1	BAMBANIN Surface water	7.22	5. 15	25	26	6	<3	35,000
2	BAMBANIN surface water	7.18	9.82	15	500	6. 10	<4	64,000
3	BAMBANIN surface water	7.36	7.85	100	8	5.55	<3	24,000

- **Soil Collection for Extent determination and Carbon stock**

For the extent determination of peatland areas, the soil collection for extent was conducted last September 25 – October 1, a total of 165 soil samples were collected, processed and submitted to ERDB MO and FWRDEC laboratory for OM analysis (ongoing). The organic matter >greater than 35% (depending on clay content) laboratory results from the collected soil samples will be the basis of the extent/boundary determination/delineation of Bambanin peatland (*RAMSAR briefing note 9)*. On the other hand, the results for bulk density will be included in the computation for the soil organic carbon in addition to the whole-ecosystems carbon stock/storage of Bambanin peatland (ERDB Technical Bulletin 2021-01). Using the open-face soil auger, a total of one hundred sixty-five (165) soil samples were collected for soil organic matter (extent) determination which was layered into 0-15cm, 15-30cm, 30-50cm, 50-100cm, and 100-300cm. The collected samples for OM will be placed into a paper cup, while twenty-five (25) soil samples for bulk density were placed in the foil ready for oven-drying. Bulk density will be used to compute the soil organic carbon. The collected samples were delivered to ERDB main Laboratory for processing and analysis.

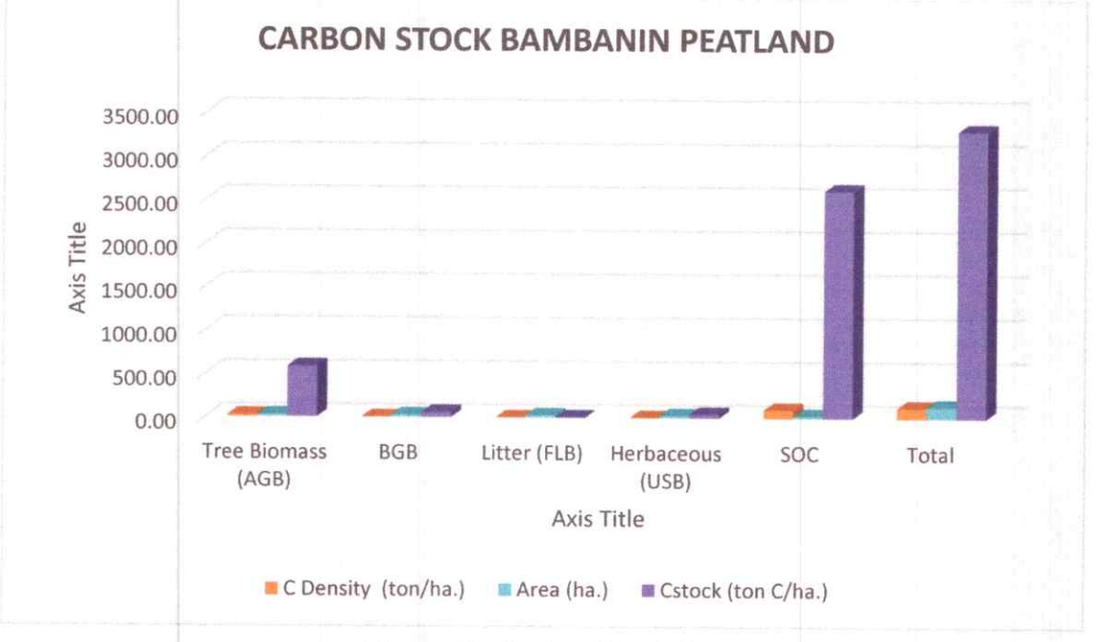


Figure 42. Carbon Stock Bambanin

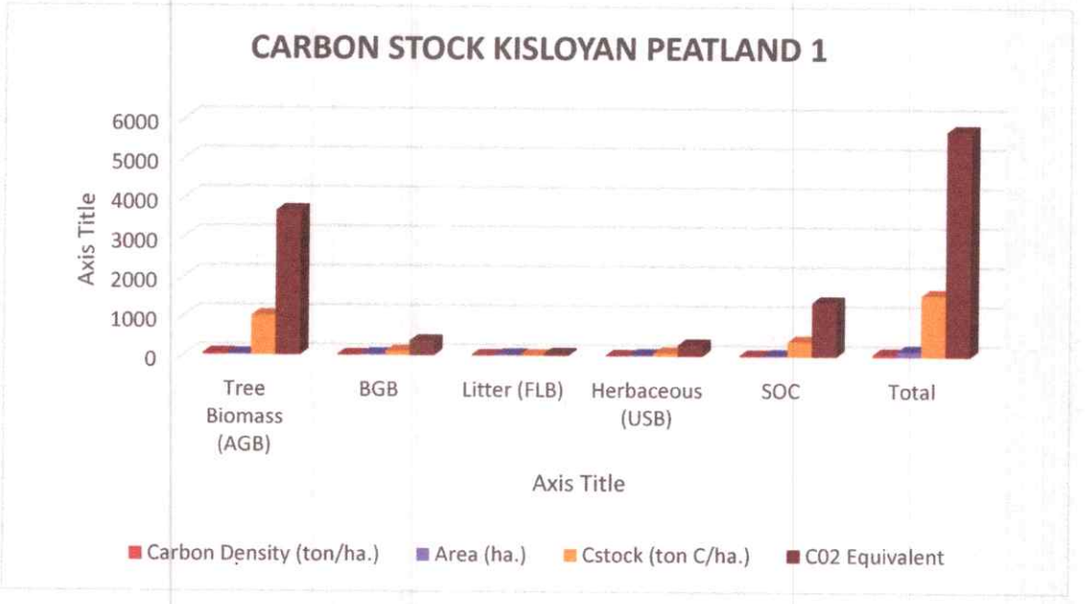


Figure 43. Carbon Stock Kisloyan Peatland 1

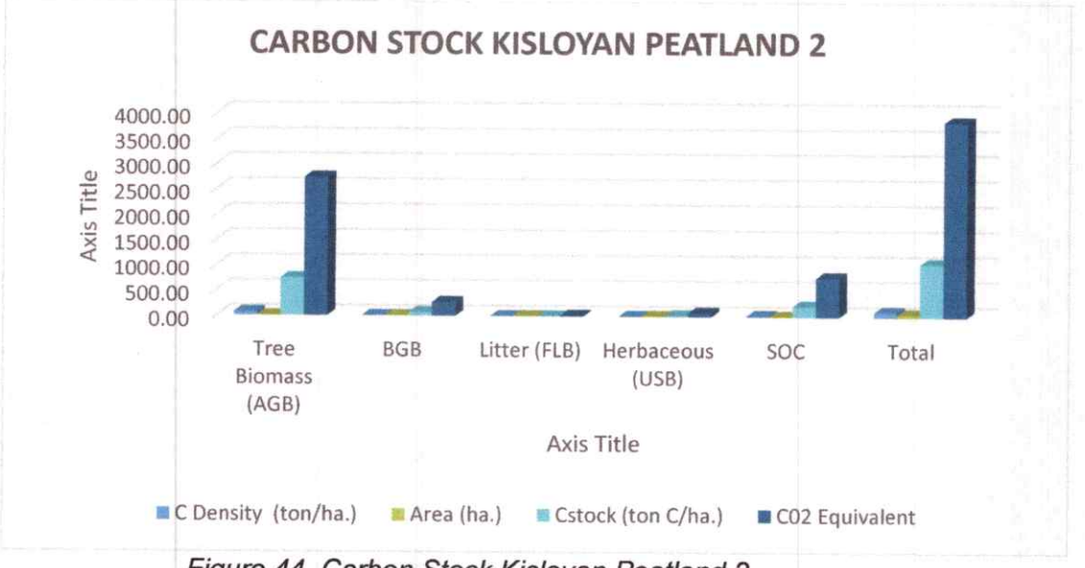


Figure 44. Carbon Stock Kisloyan Peatland 2

Figures 42, 43 and 44 above shows the carbon stock/ storage in three peatland areas. To compute the whole-ecosystem carbon stock, there are 5 carbon pools to be collected such as aboveground biomass, belowground biomass, necromass, woody debris, and soil organic carbon. This study collected all carbon pools but necromass and soil organic carbon is still in the laboratory for analysis and only AGB and BGB results are available.

For the AGB and BGB carbon stock, Kisloyan peatland 2 has the highest carbon stock with 743.21 t Carbon and BGB of 73.58 t Carbon, this implies that kisloyan peatland 2 is more forested compared to Bambanin with AGB of 586.20 tons of carbon, BGB of 58.03 t Carbon and kisloyan peatland 1 with 28.5246 t Carbon AGB and BGB of 2.8239 t Carbon. The result for necromass and soil organic carbon will be added to the data to come up with a wholistic carbon stock assessment.

Furthermore, the Kisloyan Peatland 1 has an average of 98.84 tons of carbon for BGB and and the Kisloyan Peatland 2 has 73.58 tons of carbon of BGB. The two peatlands differ from its size. With the savannah characteristics of Kisloyan Peatland 1 it has a higher BGB than Kisloyan Peatland 2 with almost closed forest/ dense forest.

Overall, the Bambanin peatland has 693.72 tons of carbon, Kisloyan Peatland 1 has 1185.18 tons of carbon and Kisloyan peatland 2 has 840.98 tons of carbon computed from Above Ground Biomass, Below Ground Biomass, Forest Litter Biomass, Understory Biomass and Soil Organic Carbon.

To contrast the Bambanin and Kisloyan Peatlands, it shows that the carbon stock computed differs from its size and characteristics (open or closed forest).

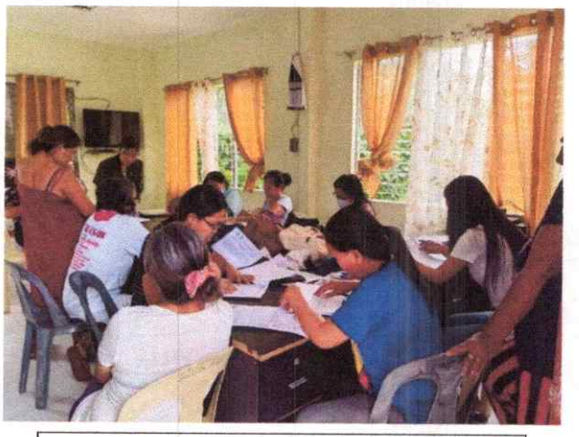
Ways Forward

The results of the collected samples will be used to determine the extent of the peatland in Bambanin. The collection of soil samples for kisloyan peatland will be scheduled for the first quarter of this year in order to complete the data for extent determination.

V. PHOTO DOCUMENTATION

SOCIO-DEMOGRAPHIC PROFILING DOCUMENTATION

Pre-testing of questionnaires for Personal Interview at Brgy. Bambanin



Pre-testing of questionnaires for Personal Interview at Brgy. Bambanin

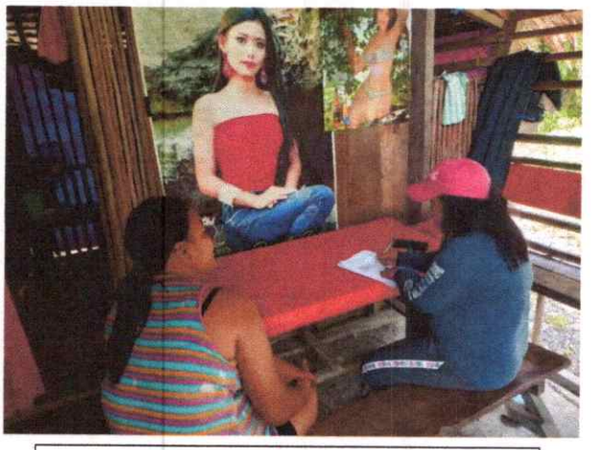


Photo documentation during the Personal Interview at Brgy. Villa Cerveza

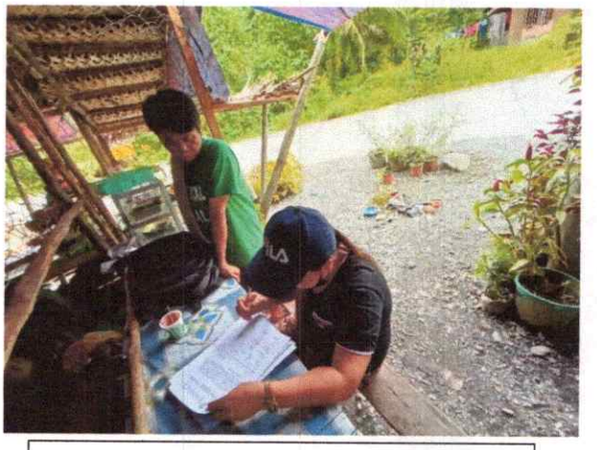
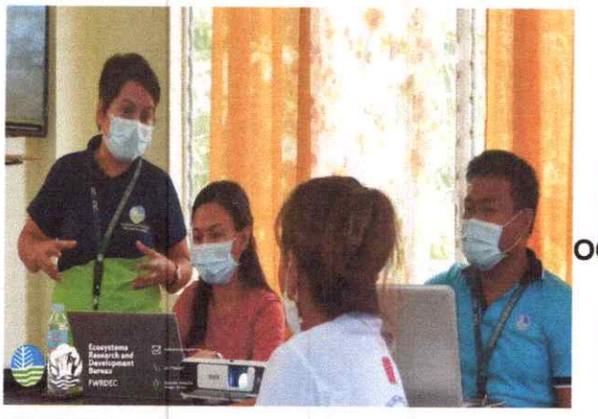


Photo documentation during the Personal Interview at Brgy Villa Cerveza

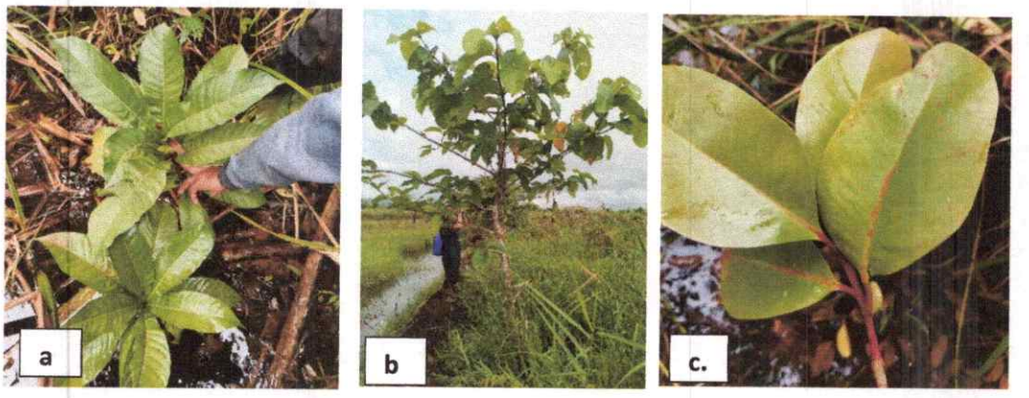


Focus Group Discussion for the men and women at Brgy Bambanin

Key Informant Interview for the men and women at Brgy. Bambanin

FLORA ASSESSMENT DOCUMENTATION

Recorded a. Broadleaves (Luffa acutangula), b. fern (Pakpak lawin), and c. broadleaves (Peace lily)



Recorded forest trees of a. Bangkal, b. Putat c. Syzygium spp.

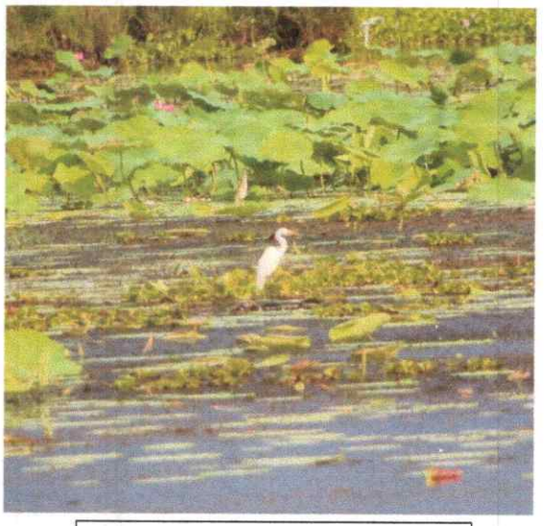
During recording of identified species of Flora

Tropical Pitcher Plant at Kisloyan Peatland

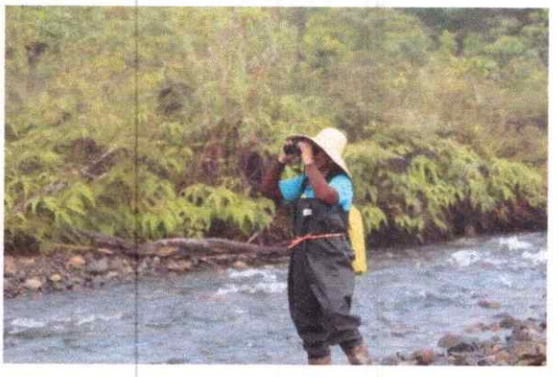
FAUNA ASSESSMENT DOCUMENTATION

Brahminy kite at Bambanin Peatland

Eurasian Tree Sparrow at Bambanin Peatland



Great Egrit at Bambanin Peatland

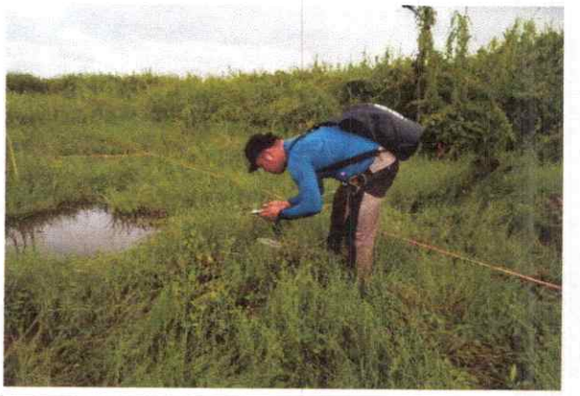


Time species count in KIsloyan Peatland

Time species count in Bambanin Peatland

MACRO FUNGAL ASSESSMENT DOCUMENTATION

Macro-fungal collection in Kisloyan Peatland



Macro-fungal collection in Bambanin Peatland

Neurothemis ramburii

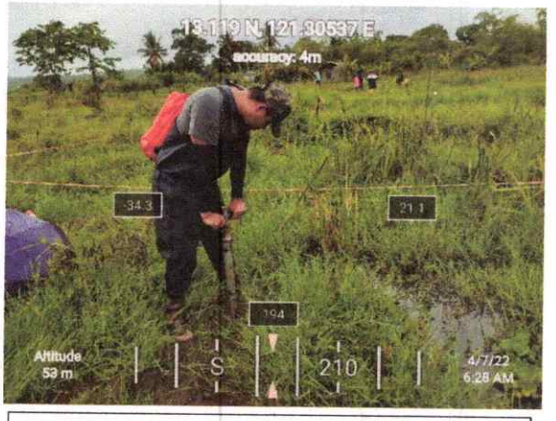
Mantispidae

Ophiocordyceps sp..-Front (left) & Back (right)

Mycena sp.- Front (left) & Back (right)

SOIL CHARACTERIZATION DOCUMENTATION

BAMBANIN, VICTORIA, ORIENTAL MINDORO

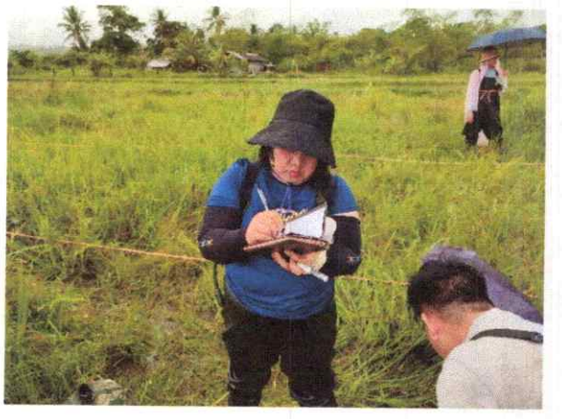


Soil sampling collection using open-paced auger at Bambanin, Victoria, Oriental

Soil measurement by layer (1-15cm,15-30cm,30-50cm and 50-100cm)

Soil sampling and soil layer cutting from the open-paced auger

Bulk density sampling using 3cm-core ring

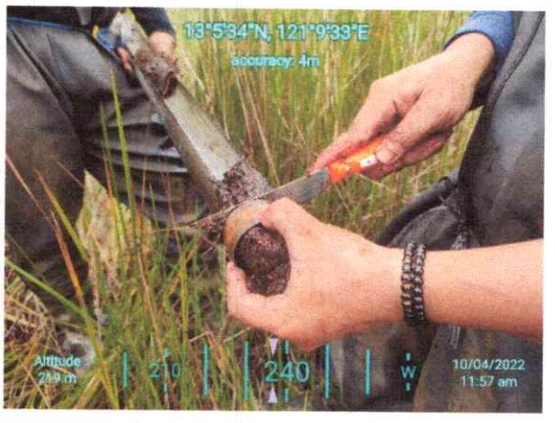


Recording of salient soil features of the area including soil color determination

KISLOYAN PARCEL 1 AND 2

Soil sampling collection using open-paced auger at PLOT 1, Kisloyan Parcel 1, Socorro, Oriental Mindoro

Soil sampling collection using open-paced auger at PLOT 2, Kisloyan Parcel 1, Socorro, Oriental Mindoro



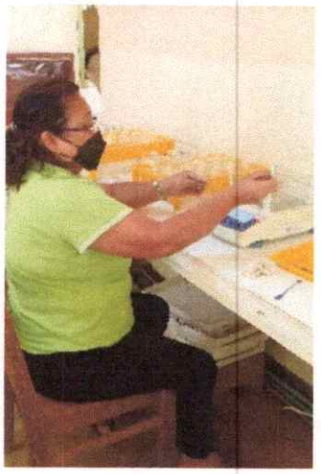
Bulk density sample collection using 3cm-corer ring at Kisloyan Parcel 1, Socorro, Oriental Mindoro

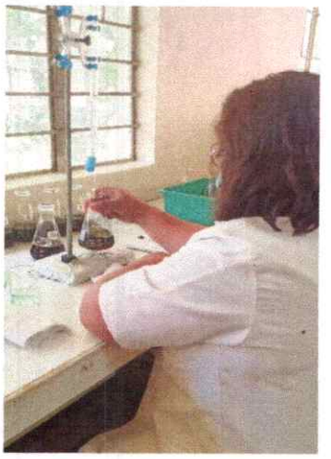
Soil peat samples placed in resealable bags

SOIL SAMPLE PROCESSING AND ANALYSIS

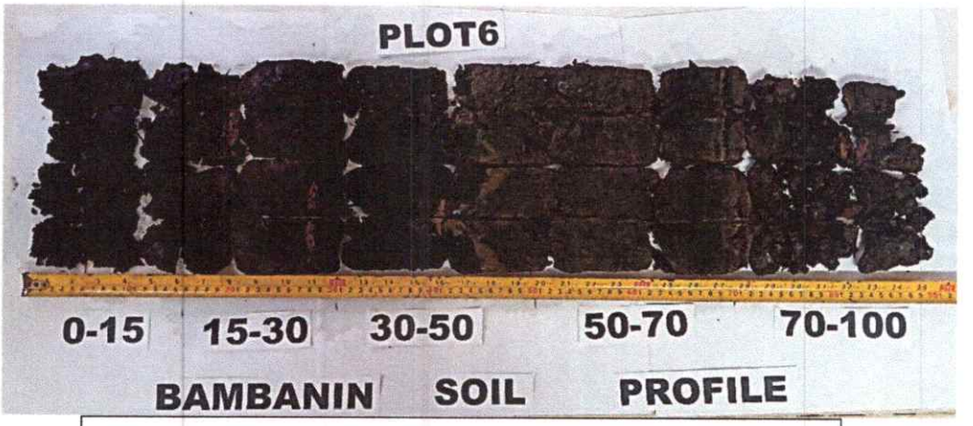
Soil samples pre- air drying during field work dated April 4-14, 2022 at Oriental

Soil samples air at FWRDEC Office, Maharlika, Bislig City





Soil analysis for peatland samples from Oriental Mindoro



Soil monolith for PLOT 6 of Bambanin Peatland, Victoria, Oriental Mindoro

WATER COLLECTION DOCUMENTATION

Collection of Surface water at Bambanin Peatland

Digging 1 meter of Ground water at Bambanin Peatland

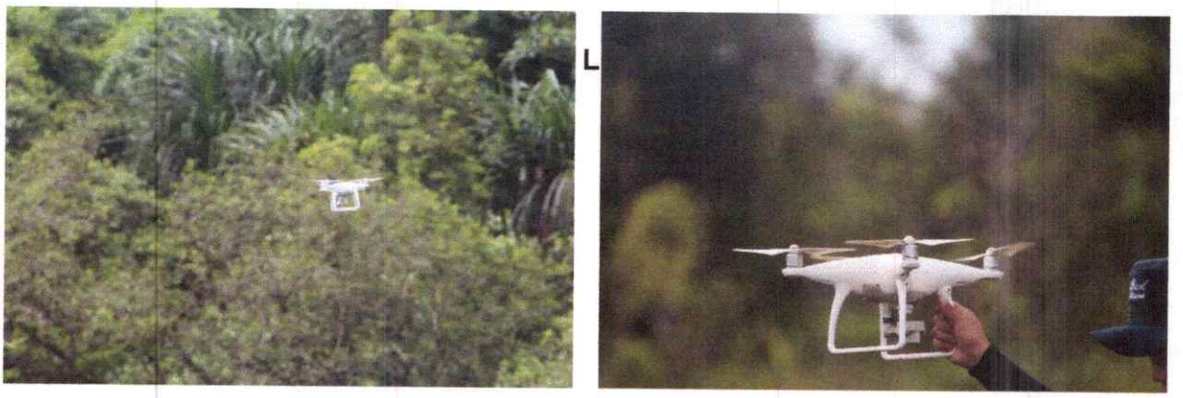
Collection of Ground water at Bambanin Peatland

Collection of Ground water at Kisloyan A Peatland

Collection for fecal analysis at Kisloyan A Peatland

MAPPING AND GEOTAGGING DOCUMENTATION

Deploying Unmanned Aerial Vehicle (UAV) Drone - DJI Phantom 4) at Kisloyan Peatland



Drone - DJI Phantom 4

EXTENT SOIL COLLECTION

Coordination photo with BLGU Bambanin

soil sample collection for extent assessment

Soil sample processing, packing and rechecking of proper labels

Department of Environment and Natural Resources
Environmental Management Bureau
MIMAROPA Region

RESULTS OF ANALYSIS

SOURCE : **BAMBANIN PEATLAND**
ADDRESS : Brgy. Bambanin,Victoria, Oriental Mindoro
SAMPLED BY : Chyra Tiña
DATE SAMPLED : 07 April 2022 DATE REPORTED : 12 May 2022
DATE RECEIVED : 08 April 2022 ARF/SS CODE : CAL-22-111

Laboratory Sample Code	Station Number	Time of Collection	Station Identification
22-0247C	1	0930H	Plot 2 Surface Water
22-0248C	2	0220H	Plot 4 Surface Water
22-0249C	3	0430H	Plot 6 Surface Water

CHARACTERISTIC	Method of Analysis	Environmental Condition	Date Analyzed	LABORATORY SAMPLE CODE		
				22-0247C	22-0248C	22-0249C
Color, TCU	Visual Comparison; SMEWW 2120 B	33-39 %RH, 18-19.5 °C	08 Apr 2022	25	100	40
BOD_5, mg/L	5day BOD Test; SMEWW 5210 B	35-41 %RH, 19.7-20.3 °C	08-13 Apr 2022	<3	<3	<3
Dissolved Oxygen (DO), mg/L	Azide Modified Method; SMEWW 4500-O C	35-41 %RH, 19.7-20.3 °C	13 Apr 2022	6.00	5.55	3.85
Fecal Coliforms, MPN/100ml	Multiple Tube Fermentation Technique; SMEWW 9221 B-C	29.5-88.1 %RH, 20.5-34.6 °C	09 Apr 2022	35,000	54,000	24,000
Chloride (Cl^-), mg/L	Argentometric Method; SMEWW 4500 B	33-50 %RH, 18.9-20.6 °C	19 Apr 2022	5.15	7.85	7.36
pH (Laboratory @ 25°C)	Electrometric Method; SMEWW 4500-H-B	33-39 %RH, 18-19.5 °C	08 Apr 2022	7.22	7.15	7.09
Total Suspended Solids, mg/L	Gravimetric Method- Dried at 103-105°C; SMEWW 2540 B	33-41 %RH, 19.3-20.2 °C	13 Apr 2022	26	8	5

NOTE: Measurement Uncertainty (MU) is available upon request.
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Department of Environment and Natural Resources
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22-0247C	1	0930H	Plot 2 Surface Water
22-0248C	2	0220H	Plot 4 Surface Water
22-0249C	3	0430H	Plot 6 Surface Water

CHARACTERISTIC	Method of Analysis	Environmental Condition	Date Analyzed	LABORATORY SAMPLE CODE		
				22-0247C	22-0248C	22-0249C
Color, TCU	Visual Comparison; SMEWW 2120 B	33-39 %RH, 18-19.5 °C	08 Apr 2022	25	100	40
BOD_5, mg/L	5day BOD Test; SMEWW 5210 B	35-41 %RH, 19.7-20.3 °C	08-13 Apr 2022	<3	<3	<3
Dissolved Oxygen (DO), mg/L	Azide Modified Method; SMEWW 4500-O C	35-41 %RH, 19.7-20.3 °C	13 Apr 2022	6.00	5.55	3.85
Fecal Coliforms, MPN/100ml	Multiple Tube Fermentation Technique; SMEWW 9221 B-C	29.5-88.1 %RH, 20.5-34.6 °C	09 Apr 2022	35,000	54,000	24,000
Chloride (Cl^-), mg/L	Argentometric Method; SMEWW 4500 B	33-50 %RH, 18.9-20.6 °C	19 Apr 2022	5.15	7.85	7.36
pH (Laboratory @ 25°C)	Electrometric Method; SMEWW 4500-H-B	33-39 %RH, 18-19.5 °C	08 Apr 2022	7.22	7.15	7.09
Total Suspended Solids, mg/L	Gravimetric Method- Dried at 103-105°C; SMEWW 2540 B	33-41 %RH, 19.3-20.2 °C	13 Apr 2022	26	8	5

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SOURCE : **BAMBANIN PEATLAND**
ADDRESS : Brgy. Bambanin, Victoria, Oriental Mindoro
SAMPLED BY : Chyra Tiña
DATE SAMPLED : 07 April 2022 DATE REPORTED : 12 May 2022
DATE RECEIVED : 08 April 2022 ARF/SS CODE : CAL-22-111

Laboratory Sample Code	Station Number	Time of Collection	Station Identifieation
22-0250C	4	0930H	Plot 2 Ground Water
22-0251C	5	0220H	Plot 4 Ground Water
22-0252C	6	0430H	Plot 6 Ground Water

CHARACTERISTIC	Method of Analysis	Environmental Condition	Date Analyzed	LABORATORY SAMPLE CODE		
				22-0250C	22-0251C	22-0252C
Color, TCU	Visual Comparison; SMEWW 2120 B	33-39 %RH, 18-19.5 °C	08 Apr 2022	15	100	250
BOD_5, mg/L	5day BOD Test; SMEWW 5210 B	35-41 %RH, 19.7-20.3 °C	08-13 Apr 2022	<4	5	15
Dissolved Oxygen (DO), mg/L	Azide Modified Method; SMEWW 4500-O C	35-41 %RH, 19.7-20.3 °C	13 Apr 2022	6.10	4.90	4.50
Chloride (Cl^-), mg/L	Argentometric Method; SMEWW 4500 B	33-50 %RH, 18.9-20.6 °C	19 Apr 2022	9.82	22.09	7.36
pH (Laboratory @ 25°C)	Electrometric Method; SMEWW 4500-H-B	33-39 %RH, 18-19.5 °C	08 Apr 2022	6.91	6.27	6.82
Total Suspended Solids, mg/L	Gravimetric Method-Dried at 103-105°C; SMEWW 2540 B	33-41 %RH, 19.3-20.2 °C	13 Apr 2022	500	385	550

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R4B-2022-007966

Department of Environment and Natural Resources
Environmental Management Bureau
MIMAROPA Region

RESULTS OF ANALYSIS

SOURCE : **KISLOYAN PEATLAND**
ADDRESS : Brgy. Villa Cerveza, Oriental Mindoro
SAMPLED BY : Chyra Tiña
DATE SAMPLED : 10 April 2022 DATE REPORTED : 12 May 2022
DATE RECEIVED : 11 April 2022 ARF/SS CODE : CAL-22-112

Laboratory Sample Code	Station Number	Time of Collection	Station Identification
22-0253C	1	0910H	Kisloyan Parcel A Plot 2 surface water
22-0254C	2	1100H	Kisloyan Parcel A Plot 4 surface water

CHARACTERISTIC	Method of Analysis	Environmental Condition	Date Analyzed	LABORATORY SAMPLE CODE	
				22-0253C	22-0254C
Color, TCU	Visual Comparison; SMEWW 2120 B	33-41 %RH, 19.3-20.2 °C	11 Apr 2022	20	20
Fecal Coliforms, MPN/100ml	Multiple Tube Fermentation Technique; SMEWW 9221 B-C	29.5-88.1 %RH, 20.5-34.6 °C	12 Apr 2022	<1.8	490
Chloride (Cl^-), mg/L	Argentometric Method; SMEWW 4500 B	33-50 %RH, 18.9-20.6 °C	19 Apr 2022	2.94	3.44
pH (Laboratory @ 25°C)	Electrometric Method; SMEWW 4500-H-B	33-41 %RH, 19.3-20.2 °C	11 Apr 2022	5.73	5.56
Total Suspended Solids, mg/L	Gravimetric Method-Dried at 103-105°C; SMEWW 2540 B	33-41 %RH, 19.3-20.2 °C	13 Apr 2022	12	24
Phosphate ($P\text{-}PO_4$), mg/L	Ascorbic Acid Method; SMEWW 4500 E	43-48 %RH, 18.2-19.1 °C	12 Apr 2022	0.02	0.03
Nitrates ($N\text{-}NO_3$), mg/L	Nitrate Electrode Method; SMEWW 4500-D	43-48 %RH, 18.2-19.1 °C	12 Apr 2022	<1	<1

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RESULTS OF ANALYSIS

SOURCE : **KISLOYAN PEATLAND**
ADDRESS : Brgy. Villa Cerveza, Oriental Mindoro
SAMPLED BY : Chyra Tiña
DATE SAMPLED : 10 April 2022 DATE REPORTED : 12 May 2022
DATE RECEIVED : 11 April 2022 ARF/SS CODE : CAL-22-112

Laboratory Sample Code	Station Number	Time of Collection	Station Identification
22-0255C	3	0910H	Kisloyan Parcel A Plot 2 ground water
22-0256C	4	1100H	Kisloyan Parcel A Plot 4 ground water

CHARACTERISTIC	Method of Analysis	Environmental Condition	Date Analyzed	LABORATORY SAMPLE CODE	
				22-0255C	22-0256C
Color, TCU	Visual Comparison; SMEWW 2120 B	33-41 %RH, 19.3-20.2 °C	11 Apr 2022	25	40w
Chloride (Cl^-), mg/L	Argentometric Method; SMEWW 4500 B	33-50 %RH, 18.9-20.6 °C	19 Apr 2022	12.27	17.18
pH (Laboratory @ 25°C)	Electrometric Method; SMEWW 4500-H-B	33-41 %RH, 19.3-20.2 °C	11 Apr 2022	4.57	4.80
Total Suspended Solids, mg/L	Gravimetric Method-Dried at 103-105°C; SMEWW 2540 B	33-41 %RH, 19.3-20.2 °C	13 Apr 2022	312	410
Phosphate ($P\text{-}PO_4$), mg/L	Ascorbic Acid Method; SMEWW 4500 E	43-48 %RH, 18.2-19.1 °C	12 Apr 2022	0.64	0.88
Nitrates ($N\text{-}NO_3$), mg/L	Nitrate Electrode Method; SMEWW 4500-D	43-48 %RH, 18.2-19.1 °C	12 Apr 2022	<1	<1

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R4B-2022-008445

Appendix table 1.0 Soil test values of soil samples analyzed from Bambanin, Victoria, Oriental Mindoro taken dated April 4-14, 2022.

Sample No.	laboratory No.	Sample Label	Description	SOIL TEST RESULTS									C/N Ratio
				pH**	Nitrogen ***	Avail. P * (ppm)	Exch K. * (me/100g)	Organic matter** (%)	Soil Organic Carbon*** (%)	BULK density** (g/cm3)	Soil Organic Carbon kgC/Ha	Soil Organic Carbon tC/Ha	
PLOT 1 - SUBPLOT 1	1	0-15	converted	5.80	0.26	> 4 (VL)	0.3-0.5 (L)	5.13	2.98	0.95	8,483.06	8.48	11.63
	2	15-30	converted	5.80	0.31	> 4 (VL)	0.3-0.5 (L)	6.15	3.58	1.19	12,789.43	12.79	11.63
	3	30-50	converted	5.20	0.08	> 4 (VL)	0.3-0.5 (L)	1.54	0.89	1.28	3,420.24	3.42	11.63
	4	50-100	converted	5.20	0.21	> 4 (VL)	0.3-0.5 (L)	4.10	2.38	1.32	9,455.64	9.46	11.63
		Average	converted	**5.50**	**0.21**	**> 4 (VL)**	**0.3-0.5 (L)**	**4.23**	**2.46**	**1.18**	**8,537.09**	**8.54**	**11.63**
PLOT 1 - SUBPLOT 2	5	0-15	converted	5.80	0.15	> 4 (VL)	0.3-0.5 (L)	3.08	1.79	0.93	5,000.68	5.00	11.63
	6	15-30	converted	5.80	0.15	> 4 (VL)	0.3-0.5 (L)	3.08	1.79	1.23	6,581.13	6.58	11.63
	7	30-50	converted	5.20	0.38	> 4 (VL)	0.3-0.5 (L)	7.69	4.47	1.10	14,771.06	14.77	11.63
		Average	converted	**5.60**	**0.23**	**> 4 (VL)**	**0.3-0.5 (L)**	**4.61**	**2.68**	**1.09**	**8,784.29**	**8.78**	11.63
PLOT 1 - SUBPLOT 3	8	0-15	converted	5.20	0.10	> 4 (VL)	0.3-0.5 (L)	2.05	1.19	1.12	4,014.59	4.01	11.63
	9	15-30	converted	5.00	0.26	> 4 (VL)	0.3-0.5 (L)	5.13	2.98	1.24	11,063.10	11.06	11.63
	10	30-50	converted	5.00	0.48	> 4 (VL)	0.3-0.5 (L)	9.68	5.63	1.03	17,312.10	17.31	11.63
	11	50-100	converted	5.00	0.46	> 4 (VL)	0.3-0.5 (L)	9.23	5.36	1.43	23,001.52	23.00	11.63
		Average	converted	**5.05**	**0.33**	**> 4 (VL)**	**0.3-0.5 (L)**	**6.52**	**3.79**	**1.20**	**13,847.83**	**13.85**	11.63
PLOT 2- SUBPLOT 1	12	0-15	swampy/ submerge	5.20	2.74	> 4 (VL)	0.3-0.5 (L)	54.85	31.89	0.67	63,885.01	63.89	11.63
	13	15-30	swampy/ submerge	5.20	1.61	> 4 (VL)	0.3-0.5 (L)	32.29	18.77	1.07	60,421.55	60.42	11.63
	14	30-50	swampy/ submerge	5.00	1.05	> 4 (VL)	0.3-0.5 (L)	21.02	12.22	1.62	59,426.00	59.43	11.63
	15	50-100	swampy/ submerge	5.00	1.05	> 4 (VL)	0.3-0.5 (L)	21.02	12.22	1.33	48,903.22	48.90	11.63
		Average	swampy/ submerge	**5.10**	**1.61**	**> 4 (VL)**	**0.3-0.5 (L)**	**32.29**	**18.77**	**1.17**	**58,158.95**	**58.16**	11.63

Sample No.	laboratory No.	Sample Label	Description	SOIL TEST RESULTS									C/N Ratio
				pH**	Nitrogen ***	Avail. P * (ppm)	Exch K. * (me/100g)	Organic matter** (%)	Soil Organic Carbon*** (%)	BULK density** (g/cm3)	Soil Organic Carbon kgC/Ha	Soil Organic Carbon tC/Ha	
PLOT 2 - SUBPLOT 2	16	0-15	swampy/ submerge	5.20	1.26	> 4 (VL)	0.3-0.5 (L)	25.12	14.60	0.76	33,227.12	33.23	11.63
	17	15-30	swampy/ submerge	5.20	1.23	> 4 (VL)	0.3-0.5 (L)	24.60	14.30	1.10	47,267.40	47.27	11.63
	18	30-50	swampy/ submerge	5.00	1.41	> 4 (VL)	0.3-0.5 (L)	28.19	16.39	1.15	56,463.68	56.46	11.63
	19	50-100	swampy/ submerge	5.00	1.67	> 4 (VL)	0.3-0.5 (L)	33.32	19.37	1.34	77,617.30	77.62	11.63
	Average		swampy/ submerge	**5.10**	**1.39**	**> 4 (VL)**	**0.3-0.5 (L)**	**27.81**	**16.17**	**1.09**	**53,643.88**	**53.64**	11.63
PLOT 2 - SUBPLOT 3	20	0-15	swampy/ submerge	5.20	1.08	> 4 (VL)	0.3-0.5 (L)	21.53	12.52	1.07	40,337.76	40.34	11.63
	21	15-30	swampy/ submerge	5.20	1.05	> 4 (VL)	0.3-0.5 (L)	21.02	12.22	1.06	38,712.74	38.71	11.63
	22	30-50	swampy/ submerge	5.00	1.03	> 4 (VL)	0.3-0.5 (L)	20.50	11.92	1.18	42,253.21	42.25	11.63
	23	50-100	swampy/ submerge	5.00	1.18	> 4 (VL)	0.3-0.5 (L)	23.58	13.71	1.09	44,987.24	44.99	11.63
	Average		swampy/ submerge	**5.10**	**1.08**	**> 4 (VL)**	**0.3-0.5 (L)**	**21.66**	**12.59**	**1.10**	**41,572.74**	**41.57**	11.63
PLOT 3- SUBPLOT 1	24	0-15	converted	5.20	1.54	> 4 (VL)	0.3-0.5 (L)	30.75	17.88	0.97	51,870.94	51.87	11.63
	25	15-30	converted	5.00	0.38	> 4 (VL)	0.3-0.5 (L)	7.64	4.44	1.20	16,022.51	16.02	11.63
	26	30-50	converted	5.00	0.43	> 4 (VL)	0.3-0.5 (L)	8.66	5.03	1.00	15,101.96	15.10	11.63
	Average		converted	**5.07**	**0.78**	**> 4 (VL)**	**0.3-0.5 (L)**	**15.68**	**9.12**	**1.06**	**27,665.14**	**27.67**	11.63
PLOT 3 - SUBPLOT 2	27	0-15	partly converted	5.40	1.37	> 4 (VL)	0.3-0.5 (L)	27.50	15.99	1.24	59,637.56	59.64	11.63
	28	15-30	partly converted	5.40	1.43	> 4 (VL)	0.3-0.5 (L)	28.52	16.58	1.33	66,355.21	66.36	11.63
	29	30-50	partly converted	5.00	1.32	> 4 (VL)	0.3-0.5 (L)	26.48	15.39	1.08	49,683.21	49.68	11.63
	30	50-100	partly converted	5.00	1.12	> 4 (VL)	0.3-0.5 (L)	22.41	13.03	1.16	45,228.04	45.23	11.63
	Average		partly converted	**5.20**	**1.31**	**> 4 (VL)**	**0.3-0.5 (L)**	**26.22**	**15.25**	**1.20**	**55,226.00**	**55.23**	11.63

Sample No.	laboratory No.	Sample Label	Description	SOIL TEST RESULTS									C/N Ratio
				pH**	Nitrogen ***	Avail. P * (ppm)	Exch K. * (me/100g)	Organic matter** (%)	Soil Organic Carbon*** (%)	BULK density** (g/cm3)	Soil Organic Carbon kgC/Ha	Soil Organic Carbon tC/Ha	
PLOT 3 - SUBPLOT 3	31	0-15	grassland/ swampy	5.40	1.37	> 4 (VL)	0.3-0.5 (L)	27.50	15.99	0.58	27,753.57	27.75	11.63
	32	15-30	grassland/ swampy	5.40	1.35	> 4 (VL)	0.3-0.5 (L)	26.99	15.69	0.66	31,293.55	31.29	11.63
	33	30-50	grassland/ swampy	5.00	1.40	> 4 (VL)	0.3-0.5 (L)	28.01	16.28	0.84	41,109.69	41.11	11.63
	34	50-100	grassland/ swampy	5.00	1.35	> 4 (VL)	0.3-0.5 (L)	26.99	15.69	1.32	61,947.01	61.95	11.63
	Average		grassland/ swampy	**5.20**	**1.37**	> 4 (VL)	0.3-0.5 (L)	**27.37**	**15.91**	**0.85**	**40,525.95**	**40.53**	11.63
PLOT 4- SUBPLOT 1	35	0-15	grassland/ undisturbed	5.40	1.35	> 4 (VL)	0.3-0.5 (L)	26.99	15.69	0.76	35,916.46	35.92	11.63
	36	15-30	grassland/ undisturbed	5.40	1.50	> 4 (VL)	0.3-0.5 (L)	30.04	17.47	0.85	44,416.18	44.42	11.63
	37	30-50	grassland/ undisturbed	5.00	1.81	> 4 (VL)	0.3-0.5 (L)	36.15	21.02	1.15	72,600.50	72.60	11.63
	38	50-100	grassland/ undisturbed	5.00	1.73	> 4 (VL)	0.3-0.5 (L)	34.63	20.13	0.75	45,077.74	45.08	11.63
	Average		grassland/ undisturbed	**5.20**	**1.60**	**> 4 (VL)**	**0.3-0.5 (L)**	**31.95**	**18.58**	**0.88**	**49,502.72**	**49.50**	11.63
PLOT 4 - SUBPLOT 2	39	0-15	grassland/ undisturbed	5.40	1.37	> 4 (VL)	0.3-0.5 (L)	27.50	15.99	1.02	49,130.34	49.13	11.63
	40	15-30	grassland/ undisturbed	5.00	1.88	> 4 (VL)	0.3-0.5 (L)	37.68	21.91	0.97	63,751.89	63.75	11.63
	41	30-50	grassland/ undisturbed	5.00	1.65	> 4 (VL)	0.3-0.5 (L)	33.10	19.24	0.60	34,453.77	34.45	11.63
	72	50-100	grassland/ undisturbed	5.00	2.00	> 4 (VL)	0.3-0.5 (L)	39.91	23.20	1.02	70,886.53	70.89	11.63
	Average		grassland/ undisturbed	**5.10**	**1.73**	**> 4 (VL)**	**0.3-0.5 (L)**	**34.55**	**20.09**	**0.90**	**54,555.63**	**54.56**	11.63

Sample No.	laboratory No.	Sample Label	Description	SOIL TEST RESULTS									C/N Ratio
				pH**	Nitrogen ***	Avail. P * (ppm)	Exch K. * (me/100g)	Organic matter** (%)	Soil Organic Carbon*** (%)	BULK density** (g/cm3)	Soil Organic Carbon kgC/Ha	Soil Organic Carbon tC/Ha	
PLOT 4 - SUBPLOT 3	42	0-15	grassland/ undisturbed	5.80	1.71	> 4 (VL)	0.3-0.5 (L)	34.12	19.84	0.88	52,236.88	52.24	11.63
	43	15-30	grassland/ undisturbed	5.80	1.73	> 4 (VL)	0.3-0.5 (L)	34.63	20.13	1.20	72,179.14	72.18	11.63
	44	30-50	grassland/ undisturbed	5.80	1.81	> 4 (VL)	0.3-0.5 (L)	36.15	21.02	1.25	78,888.73	78.89	11.63
	45	50-100	grassland/ undisturbed	5.80	1.47	> 4 (VL)	0.3-0.5 (L)	29.32	17.05	1.02	51,920.06	51.92	11.63
	Average		grassland/ undisturbed	**5.80**	**1.68**	**> 4 (VL)**	**0.3-0.5 (L)**	**33.55**	**19.51**	**1.08**	**63,806.20**	**63.81**	11.63
PLOT 5- SUBPLOT 1	46	0-15	grassland/ undisturbed	5.40	1.03	> 4 (VL)	0.3-0.5 (L)	20.52	11.93	0.81	29,096.87	29.10	11.63
	47	15-30	grassland/ undisturbed	5.00	1.47	> 4 (VL)	0.3-0.5 (L)	29.32	17.05	1.09	55,937.69	55.94	11.63
	48	30-50	grassland/ undisturbed	5.00	1.47	> 4 (VL)	0.3-0.5 (L)	29.32	17.05	0.98	50,143.04	50.14	11.63
	49	50-100	grassland/ undisturbed	5.00	1.11	> 4 (VL)	0.3-0.5 (L)	22.28	12.95	1.02	39,459.25	39.46	11.63
	Average		grassland/ undisturbed	**5.10**	**1.27**	**> 4 (VL)**	**0.3-0.5 (L)**	**25.36**	**14.74**	**0.98**	**43,659.21**	**43.66**	11.63
PLOT 5 - SUBPLOT 2	50	0-15	grassland/ undisturbed	5.40	1.52	> 4 (VL)	0.3-0.5 (L)	30.49	17.73	1.05	55,844.97	55.84	11.63
	51	15-30	grassland/ undisturbed	5.00	1.11	> 4 (VL)	0.3-0.5 (L)	22.28	12.95	1.14	44,391.66	44.39	11.63
	52	30-50	grassland/ undisturbed	5.00	1.29	> 4 (VL)	0.3-0.5 (L)	25.80	15.00	1.38	62,143.37	62.14	11.63
	53	50-100	grassland/ undisturbed	5.00	1.17	> 4 (VL)	0.3-0.5 (L)	23.45	13.64	1.02	41,845.10	41.85	11.63
	Average		grassland/ undisturbed	**5.10**	**1.28**	**> 4 (VL)**	**0.3-0.5 (L)**	**25.51**	**14.83**	**1.15**	**51,056.28**	**51.06**	11.63

Sample No.	laboratory No.	Sample Label	Description	SOIL TEST RESULTS									C/N Ratio
				pH**	Nitrogen ***	Avail. P * (ppm)	Exch K. * (me/100g)	Organic matter** (%)	Soil Organic Carbon*** (%)	BULK density** (g/cm3)	Soil Organic Carbon kgC/Ha	Soil Organic Carbon tC/Ha	
PLOT 5 - SUBPLOT 3	54	0-15	grassland/ undisturbed	5.40	2.17	> 4 (VL)	0.3-0.5 (L)	43.39	25.23	1.15	86,789.95	86.79	11.63
	55	15-30	grassland/ undisturbed	5.00	2.23	> 4 (VL)	0.3-0.5 (L)	44.56	25.91	1.33	103,463.09	103.46	11.63
	56	30-50	grassland/ undisturbed	5.00	1.38	> 4 (VL)	0.3-0.5 (L)	27.56	16.02	1.11	53,452.94	53.45	11.63
	57	50-100	grassland/ undisturbed	5.00	2.02	> 4 (VL)	0.3-0.5 (L)	40.46	23.52	1.07	75,168.20	75.17	11.63
		Average	grassland/ undisturbed	**5.10**	**1.95**	**> 4 (VL)**	**0.3-0.5 (L)**	**38.99**	**22.67**	**1.16**	**79,718.55**	**79.72**	11.63
PLOT 6- SUBPLOT 1	58	0-15	grassland/ swampy	5.40	1.94	> 4 (VL)	0.3-0.5 (L)	38.70	22.50	0.91	61,497.46	61.50	11.63
	59	15-30	grassland/ swampy	5.40	2.61	> 4 (VL)	0.3-0.5 (L)	52.19	30.34	0.77	70,413.50	70.41	11.63
	60	30-50	grassland/ swampy	5.00	1.47	> 4 (VL)	0.3-0.5 (L)	29.32	17.05	0.77	39,171.83	39.17	11.63
	61	50-100	grassland/ swampy	5.00	1.35	> 4 (VL)	0.3-0.5 (L)	26.97	15.68	1.09	51,391.59	51.39	11.63
		Average	grassland/ swampy	**5.20**	**1.84**	**> 4 (VL)**	**0.3-0.5 (L)**	**36.79**	**21.39**	**0.89**	**55,618.60**	**55.62**	11.63
PLOT 6 - SUBPLOT 2	62	0-15	grassland/ swampy	5.40	2.40	> 4 (VL)	0.3-0.5 (L)	48.08	27.95	0.84	70,704.00	70.70	11.63
	63	15-30	grassland/ swampy	5.40	2.02	> 4 (VL)	0.3-0.5 (L)	40.46	23.52	0.87	61,627.26	61.63	11.63
	64	30-50	grassland/ swampy	5.00	1.99	> 4 (VL)	0.3-0.5 (L)	39.87	23.18	0.90	62,625.49	62.63	11.63
	65	50-100	grassland/ swampy	5.00	1.73	> 4 (VL)	0.3-0.5 (L)	34.60	20.11	1.11	67,191.67	67.19	11.63
		Average	grassland/ swampy	**5.20**	**2.04**	**> 4 (VL)**	**0.3-0.5 (L)**	**40.75**	**23.69**	**0.93**	**65,537.11**	**65.54**	11.63

Sample No.	laboratory No.	Sample Label	Description	SOIL TEST RESULTS									C/N Ratio
				pH**	Nitrogen ***	Avail. P * (ppm)	Exch K. * (me/100g)	Organic matter** (%)	Soil Organic Carbon*** (%)	BULK density** (g/cm3)	Soil Organic Carbon kgC/Ha	Soil Organic Carbon tC/Ha	
PLOT 6 - SUBPLOT 3	66	0-15	grassland/ swampy	5.40	1.97	> 4 (VL)	0.3-0.5 (L)	39.30	22.85	1.03	70,537.55	70.54	11.63
	67	15-30	grassland/ swampy	5.40	1.81	> 4 (VL)	0.3-0.5 (L)	36.28	21.09	1.02	64,729.14	64.73	11.63
	68	30-50	grassland/ swampy	5.00	1.60	> 4 (VL)	0.3-0.5 (L)	32.05	18.63	0.94	52,447.81	52.45	11.63
	69	50-100	grassland/ swampy	5.00	1.51	> 4 (VL)	0.3-0.5 (L)	30.23	17.58	0.99	52,287.66	52.29	11.63
		Average	grassland/ swampy	**5.20**	**1.72**	**> 4 (VL)**	**0.3-0.5 (L)**	**34.47**	**20.04**	**1.00**	**60,000.54**	**60.00**	11.63
Mineral Soil	70	0-15	Mineral sample	5.80	0.24	> 4 (VL)	0.3-0.5 (L)	4.84	2.81	0.96	8,120.62	8.12	11.63
	71	15-30	Mineral sample	5.80	0.21	> 4 (VL)	0.3-0.5 (L)	4.23	2.46	1.05	7,719.05	7.72	11.63
		Average	Mineral sample	**5.80**	**0.23**	**> 4 (VL)**	**0.3-0.5 (L)**	**4.54**	**2.64**	**1.00**	**7,919.84**	**7.92**	**11.63**

** STK Analysis*

*** quantitative analysis*

**** conversion factor*

Prepared by :

SHARON R. ALVEZ

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Appendix table 2.0 Soil test values of soil samples analyzed from Kisloyan-Parcel 1, Socorro, Oriental Mindoro taken dated April 4-14, 2022.

Sample No.	laboratory No.	Sample Label	Description	SOIL TEST RESULTS									C/N Ratio
				pH**	Nitrogen ***	Avail. P * (ppm)	Exch K. * (me/100g)	Organic matter** (%)	Soil Organic Carbon*** (%)	BULK density** (g/cm3)	Soil Organic Carbon kgC/Ha	Soil Organic Carbon tC/Ha	
PLOT 1 - SUBPLOT 1	73	0-15	silty clay/ boundary	5.80	0.15	> 4 (VL)	0.3-0.5 (L)	3.02	1.76	0.85	4,493.75	4.49	11.63
	74	15-30	silty clay/ boundary	5.80	0.21	> 4 (VL)	0.3-0.5 (L)	4.23	2.46	1.28	9,414.57	9.41	11.63
	75	30-50	silty clay/ boundary	5.40	0.18	> 4 (VL)	0.3-0.5 (L)	3.63	2.11	1.13	7,142.20	7.14	11.63
	76	50-100	silty clay/ boundary	5.40	0.12	> 4 (VL)	0.3-0.5 (L)	2.42	1.41	0.92	3,881.84	3.88	11.63
		Average	silty clay/ boundary	**5.60**	**0.17**	**> 4 (VL)**	**0.3-0.5 (L)**	**3.33**	**1.93**	**1.04**	**6,233.09**	**6.23**	**11.63**
PLOT 2- SUBPLOT 1	77	0-15	grassland/ fibrous	5.80	3.24	> 4 (VL)	0.3-0.5 (L)	64.70	37.62	0.49	54,903.44	54.90	11.63
	78	15-30	grassland/ fibrous	5.80	3.42	> 4 (VL)	0.3-0.5 (L)	68.33	39.73	0.68	80,850.87	80.85	11.63
	79	30-50	grassland/ fibrous	5.80	3.75	> 4 (VL)	0.3-0.5 (L)	74.98	43.59	0.68	88,931.25	88.93	11.63
		Average	grassland/ fibrous	**5.80**	**3.47**	**> 4 (VL)**	**0.3-0.5 (L)**	**69.34**	**40.31**	**0.61**	**74,895.19**	**74.90**	**11.63**
PLOT 3- SUBPLOT 1	80	0-15	grassland/ fibrous	5.80	3.66	> 4 (VL)	0.3-0.5 (L)	73.17	42.54	0.43	54,875.39	54.88	11.63
	81	15-30	grassland/ fibrous	5.80	3.84	> 4 (VL)	0.3-0.5 (L)	76.80	44.65	0.43	57,273.02	57.27	11.63
	82	15-30	grassland/ fibrous	5.80	3.54	> 4 (VL)	0.3-0.5 (L)	70.75	41.13	0.43	52,763.33	52.76	11.63
		Average	grassland/ fibrous	**5.80**	**3.68**	**> 4 (VL)**	**0.3-0.5 (L**	**73.57**	**42.77**	**0.43**	**54,970.58**	**54.97**	**11.63**
PLOT 4- SUBPLOT	83	0-15	grassland/ fibrous	5.40	3.33	> 4 (VL)	0.3-0.5 (L)	66.52	38.67	0.43	49,886.72	49.89	11.63
	84	15-30	grassland/ fibrous	5.40	2.21	> 4 (VL)	0.3-0.5 (L)	44.14	25.66	0.43	33,106.64	33.11	11.63
PLOT 4- SUBPLOT	85	0-15	grassland/ fibrous	5.40	3.75	> 4 (VL)	0.3-0.5 (L)	74.98	43.59	0.43	56,235.94	56.24	11.63
	86	15-30	grassland/ fibrous	5.40	3.57	> 4 (VL)	0.3-0.5 (L)	71.35	41.48	0.43	53,514.84	53.51	11.63
PLOT 4- SUBPLOT	87	0-15	grassland/ fibrous	5.40	2.09	> 4 (VL)	0.3-0.5 (L)	41.72	24.26	0.43	31,292.58	31.29	11.63
	88	15-30	grassland/ fibrous	5.00	2.24	> 4 (VL)	0.3-0.5 (L)	44.75	26.02	0.43	33,560.16	33.56	11.63
3		**Average**	grassland/ fibrous	**5.33**	**2.86**	**> 4 (VL)**	**0.3-0.5 (L)**	**57.24**	**33.28**	**0.43**	**42,932.81**	**42.93**	**11.63**
PLOT 5- SUBPLOT 2	89	0-15	grassland/ fibrous	5.80	1.66	> 4 (VL)	0.3-0.5 (L)	33.26	19.34	0.90	52,411.16	52.41	11.63
	90	15-30	grassland/ fibrous	5.80	1.72	> 4 (VL)	0.3-0.5 (L)	34.34	19.96	0.81	48,595.54	48.60	11.63
		Average	grassland/ fibrous	**5.80**	**1.69**	**> 4 (VL)**	**0.3-0.5 (L)**	**33.80**	**19.65**	**0.86**	**50,503.35**	**50.50**	**11.63**
PLOT 6- SUBPLOT 1	91	0-15	forested/ boundary	5.80	0.14	> 4 (VL)	0.3-0.5 (L)	2.73	1.58	1.48	7,024.10	7.02	11.63
	92	15-30	forested/ boundary	5.80	0.11	> 4 (VL)	0.3-0.5 (L)	2.18	1.27	1.68	6,371.96	6.37	11.63
	93	30-50	forested/ boundary	5.40	0.41	> 4 (VL)	0.3-0.5 (L)	8.18	4.75	1.68	23,957.75	23.96	11.63
	94	50-100	forested/ boundary	5.40	0.38	> 4 (VL)	0.3-0.5 (L)	7.63	4.44	1.68	22,360.56	22.36	11.63
		Average	forested/ boundary	**5.60**	**0.26**	**> 4 (VL)**	**0.3-0.5 (L)**	**5.18**	**3.01**	**1.63**	**14,928.59**	**14.93**	**11.63**

** STK Analysis*

*** quantitative analysis*

**** conversion factor*

Prepared by :

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Appendix table 3.0 Soil test values of soil samples analyzed from Kisloyan-Parcel 2, Socorro, Oriental Mindoro taken dated April 4-14, 2022.

Sample No.	laboratory No.	Sample Label	Description	SOIL TEST RESULTS									C/N Ratio
				pH**	Nitrogen ***	Avail. P * (ppm)	Exch K. * (me/100g)	Organic matter** (%)	Soil Organic Carbon*** (%)	BULK density** (g/cm3)	Soil Organic Carbon kgC/Ha	Soil Organic Carbon tC/Ha	
PLOT 1 - SUBPLOT 1	95	0-15	forested	5.80	2.45	> 4 (VL)	0.3-0.5 (L)	49.06	28.52	1.31	112,213.15	112.21	11.63
	96	15-30	forested	5.80	1.23	> 4 (VL)	0.3-0.5 (L)	24.53	14.26	1.36	58,110.38	58.11	11.63
	97	30-50	forested	5.40	0.93	> 4 (VL)	0.3-0.5 (L)	18.53	10.77	1.37	44,394.01	44.39	11.63
		Average	forested	**5.67**	**1.54**	> 4 (VL)	0.3-0.5 (L)	**30.71**	**17.85**	**1.35**	**71,572.51**	**71.57**	**11.63**
PLOT 2- SUBPLOT 1	98	0-15	forested	5.40	3.22	> 4 (VL)	0.3-0.5 (L)	64.32	37.39	1.08	120,682.29	120.68	11.63
	99	15-30	forested	5.40	1.53	> 4 (VL)	0.3-0.5 (L)	30.52	17.75	1.08	57,433.83	57.43	11.63
	100	30-50	forested	5.40	1.36	> 4 (VL)	0.3-0.5 (L)	27.25	15.85	1.00	47,473.69	47.47	11.63
		Average	forested	**5.40**	**2.03**	> 4 (VL)	0.3-0.5 (L)	**40.70**	**23.66**	**1.05**	**75,196.60**	**75.20**	**11.63**
PLOT 3- SUBPLOT 2	101	0-15	forested	5.40	2.92	> 4 (VL)	0.3-0.5 (L)	58.32	33.91	1.08	109,432.24	109.43	11.63
	102	15-30	forested	5.00	1.69	> 4 (VL)	0.3-0.5 (L)	33.79	19.65	1.08	63,587.45	63.59	11.63
	103	30-50	forested	5.00	1.72	> 4 (VL)	0.3-0.5 (L)	34.34	19.96	1.00	59,816.85	59.82	11.63
		Average	forested	**5.13**	**2.11**	> 4 (VL)	0.3-0.5 (L)	**42.15**	**24.51**	**1.05**	**77,612.18**	**77.61**	**11.63**
PLOT 4- SUBPLOT 1	104	0-15	forested	5.40	1.55	> 4 (VL)	0.3-0.5 (L)	31.07	18.06	1.00	54,283.76	54.28	11.63
	105	15-30	forested	5.00	1.64	> 4 (VL)	0.3-0.5 (L)	32.70	19.01	1.16	66,017.88	66.02	11.63
	106	30-50	forested	5.00	1.80	> 4 (VL)	0.3-0.5 (L)	35.97	20.92	1.17	73,662.51	73.66	11.63
	107	50-100	forested	5.00	2.26	> 4 (VL)	0.3-0.5 (L)	45.24	26.30	1.01	79,879.33	79.88	11.63
		Average	forested	5.10	1.81	> 4 (VL)	0.3-0.5 (L)	36.25	21.07	1.09	68,460.87	68.46	11.63

** STK Analysis*

*** quantitative analysis*

**** conversion factor*

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