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ASSESSMENT OF THE MANGROVE REHABILITATION PROJECT IN SITIO BONGKOL-BONGKOL, RIO TUBA, BATARAZA, PALAWAN

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29 January 2025

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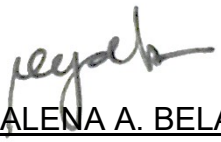

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Acceptance Page:

This Special Problem titled: **"ASSESSMENT OF THE MANGROVE REHABILITATION PROJECT IN SITIO BONGKOL-BONGKOL, RIO TUBA, BATARAZA, PALAWAN"** is hereby accepted by the Faculty of Management and Development Studies, U.P. Open University, in partial fulfilment of the requirements for the Master of Environment and Natural Resources Management.

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DECLARATION

This is to certify that:

I. The special problem comprises only my original work towards the MENRM except were indicated in the Preface

II. Due acknowledgement has been made in the text to all other material used

III. The special problem is fewer than 25,000 words in length, exclusive of tables, maps, bibliographies and appendices.

REYA MAGDALENA A. BELARO

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Abstract

The 409.42-hectare Adopt-A-Mangrove (AMA) Rehabilitation Project of Coral Bay Nickel Corporation (CBNC) and DENR-MIMAROPA is part of the bigger carbon sink initiative of DENR and environmental compliance of CBNC. The study was conducted on the part of AMA adjacent to Sitio Bongkol Bongkol with an area of 15 hectares. The aim of the study was to determine the current state of mangroves in Sitio Bongkol Bongkol and identify threats that could jeopardize the success of the AMA project. The mangrove and plant diversity identification used in the study was taken from the results of the Environmental Impact Assessment (EIA) fieldwork of Gaia South, Inc., with the researcher as part of the fieldwork team, while data on socio-economic factors were gathered through survey questionnaires and interviews. The results of the study showed three (3) mangrove species in Sitio Bongkol-Bongkol namely; *Rhizophora mucronata*, *Ceriops tagal*, and *Rhizophora apiculata* being the dominant species. The data analyzed showed that education, occupation, income, and distance of residents from mangroves influenced the communities' knowledge on mangroves. In addition, the result of the interviews showed the lack of knowledge of the Indigenous people of Sitio Bongkol-Bongkol in planting and taking care of mangroves; and that the inadequate support of other stakeholders and the absence of community involvement could delay the project implementation. The study concluded that creating awareness and active participation of nearby inhabitants were also critical. Therefore, Information, education, and communication about the benefits of nurturing mangroves must be intensified. Moreover, the support and intervention by appropriate government agencies and entities are equally important. The outcome of the study could help evaluate the state of the mangrove and effectiveness of rehabilitation efforts, the involvement of appropriate agencies for value-added livelihood support with the end view of reducing the extraction of raw mangrove materials, and the participation of capable locals in the planning, implementation, and monitoring of the project.

Keywords: Mangroves; Palawan; DENR

I. INTRODUCTION

Mangrove is an ecologically important type of forests. It provides various benefits to the environment, economy, and the community. It was found out in recent studies, however, that mangroves are declining due to its conversion for commercial purposes.

In Southern Palawan, the DENR-MIMAROPA has entered into an agreement beginning in 2023 with Coral Bay Nickel Corporation (CBNC), a mineral processing plant located in Barangay Rio Tuba, Bataraza, Palawan, to adopt a 409.42-hectare mangrove for a period of five years from 2023 to 2028. This project is undertaken by CBNC in support of the DENR's policy on mangrove management program, and as part of its Environmental Compliance Certificate (ECC) CO-1806-0014 dated December 20, 2018 where ECC Condition No. 3 of CBNC states to "*Formulate a reforestation and carbon sink program using endemic/indigenous species to mitigate greenhouse gas (GHG) emissions of the project in line with the DENR's thrust for GHG emissions reduction program and the National Greening Program to consider the impact of the expansion project in coordination with PENRO and the CENRO and submit to EMB (central and MIMAROPA) semi-annually. Implementation of the said program shall be reported to EMB (Central Office and MIMAROPA) on a semi-annual basis."*

Officially titled as Adopt-A-Mangrove (AMA) Program Project or AMA, CBNC adopted the mangroves in three barangays of the municipality of Bataraza. The company has a budget Php 12,000,000 for AMA, for the duration of five (5) years. The project implementation only started in 2024 due to several revisions of the plan, such as the roles, and responsibilities of the parties involved. CBNC's AMA are located in Barangays Ocayan, Sarong, and Rio Tuba.

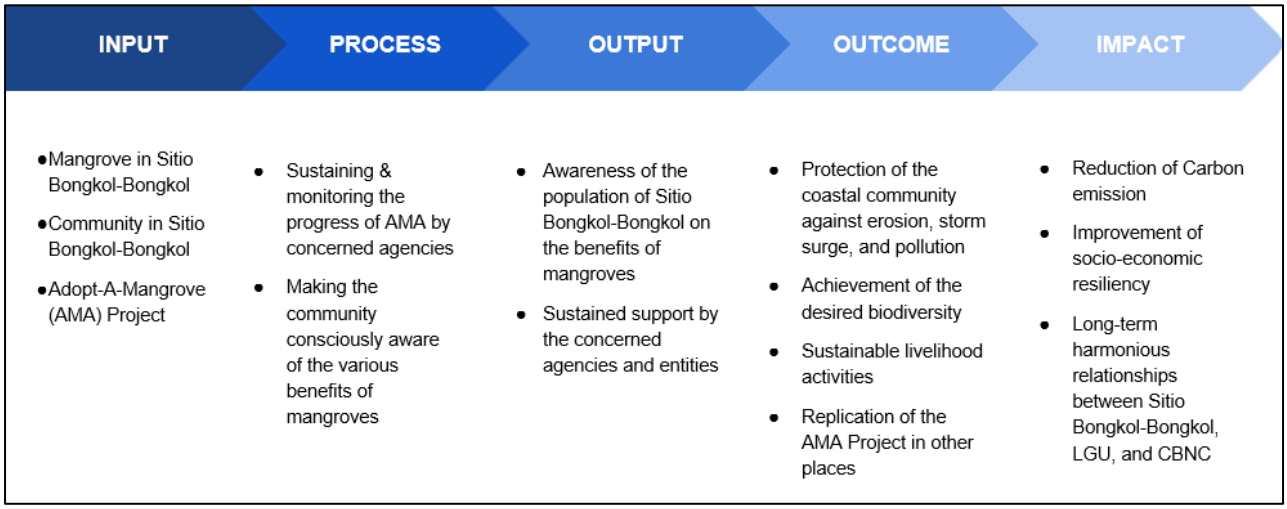
This study aims to identify if the AMA will be sustainable in Sitio Bongkol-Bongkol, an area of the AMA in Rio Tuba that has been as needing further enhancement and rehabilitation. To address the current issue if the community of Bongkol-Bongkol can sustain the project and lessen their dependence on CBNC in

doing it with them, the researcher will look into current species composition and mangrove cover in Sitio Bongkol-Bongkol, and gather data on socio-economic factors of the area that are relevant to the implementation of the Adopt-A-Mangrove Project.

The field work was conducted on-site from March 4-9, 2024. The researcher employed survey questionnaires, interviews, and focus group discussion to obtain data. Meanwhile, data in mangrove identification and diversity were derived from the results of the Environmental Impact Assessment (EIA) fieldwork of Gaia South, Inc., and other information were collected from the Coral Bay Nickel Corporation's Adopt-A-Mangrove Strategic and Management Plan, Carbon Sequestration Program, related journals, the internet, and reports of the Palawan Council for Sustainable Development.

This study also aims to generate courses of action and provide recommendations to concerned people so that appropriate support and intervention by concerned agencies and entities and a high level of awareness resulting in the active participation of the community.

Figure 1. Conceptual Framework.



II. REVIEW OF RELATED LITERATURE

Mangroves are defined as a type of vegetation that varies in species and thrives along the mudflats or shallow coasts of bodies of water such as rivers and streams that contribute to the ecological function of the ecosystem. In layman's terms, mangroves are found where the land meets the water (Giesen, et al., 2007).

Due to their complexity in structure and uniqueness from other species of plants, mangrove environments are the most biologically productive ecosystems. Mangroves provide regulatory services by supporting the stability of the coast and reducing flooding and tidal surge impacts. It protects coastal communities against the devastating impacts of storms. Mangroves also provide habitat and act as recycling sites for a variety of plants and animals (Gonzales, et al., 2017). Another example of a regulatory service provided by mangrove is that it supports the carbon cycle and plays an important role in carbon sequestration. In a study conducted by C. Nyanga in 2020, there was a mentioned of that up to four times of carbon can be stored by mangrove, and this is more than the amount of carbon that can be stored by the forests.

Mangrove forests can be a viable as a source of livelihood of coastal communities in the Philippines. People have been using mangroves for subsistence and other economic purposes. Mangroves provide goods and services in many ways, like timber (such as firewood, charcoal, and construction materials) and non-timber (such as dye and medicine) harvesting (Song et al., 2021). Also, mangroves have remained valuable and culturally important to residents, creating tourism and a repository of traditional knowledge. It is noteworthy that the protection and management of mangrove forests have been regarded as manifestations of traditional practices, beliefs, and values of the Indigenous People. This is important to CBNC because the populace of the area where the company operates is dominantly IP.

Despite the ecological importance of mangroves, they are often subjected to degradation (Osing et al., 2019). The Province of Palawan has seen a slight decline in the forest cover of mangroves from 63,532 hectares in 2010 to 59,421 hectares in 2015 (PCSDS, 2020). According to the State of the Environment Report 2020 Updates

of Palawan Council for Sustainable Development, the conversion of land into commercial and residential use has led to a reduction in mangrove cover.

The decline of mangroves may also be attributed to its direct benefits given to the community. In the study conducted by Gonzales, et.al in 2017, he mentioned that the community in Bataraza, Palawan used mangroves for housing material and charcoal production, caused by low level of knowledge regarding the mangrove biodiversity function.

III. STATEMENT OF THE STUDY

As part of the 409.42-hectare project site of the Adopt-A-Mangrove (AMA) Project, the study intends to identify whether the mangrove rehabilitation project will be sustainable in the long run, particularly in Sitio Bongkol-Bongkol, Rio Tuba, Bataraza, Palawan with 15 hectares. Specifically, this study answers the following questions:

1. Will the community be able to sustain the livelihood given to them through the AMA Project?
2. Will the community lessen their dependence on mangroves as part of their livelihood?

IV. OBJECTIVES OF THE STUDY

This study will attempt to determine the current state of the mangroves in Sitio Bongkol-Bongkol; and identify threats that can jeopardize the success of the project. In particular, the objectives are: (1) to identify the current species composition of mangroves and plant diversity as indicator of success of planting and nurturing the mangroves in Sitio Bongkol-Bongkol; and (2) to gather data on socio-economic factors of the adjacent community that are relevant to the implementation of the Adopt-A-Mangrove Project.

V. RATIONALE

Mangrove degradation is a growing concern. It jeopardizes the integrity of coastlines and biodiversity, and economies of shoreline communities; and it contributes to global warming. The Adopt-A-Mangrove has gained attention as a potential intervention to enhance Rio Tuba's resilience against socio-economic problems, natural disasters, including climate change impacts.

Findings from this study will have importance to the following:

The Adopt a Mangrove project (AMA). Updated and additional data will aid the participants of the AMA, particularly the **CBNC** in prioritizing and subsequently providing the appropriate support needed in sustaining the project; and the **MLGU Bataraza and PLGU Palawan** to ensure the effectiveness of intervention actions in capacitating the community in helping and in enforcing environmental preservation laws.

The Palawan Regional Office of the Department of Environment and Natural Resources or DENR-MIMAROPA. The findings and corresponding recommendations in Sitio Bongkol-Bongkol can be further studied for their applicability to similar or related projects in other parts of MIMAROPA. The end goal is to help offset carbon emission, promote biodiversity, mitigate the erosion of shorelines and contamination of seawater, and aid in the socio-economic development in the countryside.

The people of Sitio Bongkol-Bongkol. The findings shall be the bases in formulating suitable and acceptable ways and means to educate everybody of the need to protect and nurture the mangrove for their own benefits as well as that of generations to come.

VI. SCOPE AND LIMITATIONS

This study covers the AMA Project area in Barangay Rio Tuba at Sitio Bongkol-Bongkol. The respondents of the study were the households, religious leaders, and IP Chieftain from March 5-8, 2024. The information and data collected from CBNC, LGU Rio Tuba, and DENR-PENRO were limited to the information provided by them.

VII. METHODOLOGY

A survey of the area was done on the first day of visit in Brgy. Rio Tuba, Bataraza, Palawan, followed by a courtesy call to the Barangay Captain. Coordination with the Barangay Health Workers and barangay Rio Tuba Chair for the Environment followed right after.

Demographic data, knowledge of mangroves, and level of awareness of the AMA Project were collected by a survey questionnaire and interviews (see Appendix A) of households and individual citizens of Sito Bongkol-Bongkol. The total sample size of the respondent is 60 out of the total population of 1,512.

A Key Informant Interview (KII) of the IP Chieftain, religious leaders, Barangay Rio Tuba Patrol Group, the Environmental Group of Coral Bay Nickel Corporation, and employees at CENRO Brooke's Point were done. The KII was used crosscheck the household interviews. A Focus Group Discussion (FGD) was also conducted to identify the factors affecting human-related mangrove disturbances in the community.

Mangrove species identification and plants diversity were derived from the results of the Environmental Impact Assessment (EIA) fieldwork of Gaia South, Inc., conducted from March 4-8, 2024. The researcher went together with the Gaia team during the actual visit as a member of the CBNC team that conducted part of the baseline data for the Environmental Performance Report & Management Program (EPRMP) of CBNC. Discussion/write-up was prepared by the Flora specialist of Gaia, while other flora associated species and fauna species were taken by the researcher from secondary data in the EPRMP.

In addition to the EPRMP, secondary information were gathered from Adopt-A-Mangrove Strategic and Management Plan, related journals, the internet, and PCSD reports. Descriptive statistics was employed and used the percentage, and frequency to summarise and analyze the respondents' demographic knowledge and perception data.

VIII. DESCRIPTION OF THE STUDY AREA

Sitio Bongkol-Bongkol is one of the 11 sitios of Barangay Rio Tuba, Municipality of Bataraza, Palawan. The sitio is about five kilometers southeast from the center of the barangay. The sitio is located along the eastern coast near the southern tip of Palawan Island. (see Figure 7.2)

Sitio Bongkol-Bongkol is approximately 850 km southwest of Manila. It is accessible from Manila by direct chartered flight to a private airport in Brgy Rio Tuba and by commercial flights to the international airport in Puerto Princesa City and then an onward 10-minute and 5-hour land travel, respectively.

As of 2023 Sitio Bongkol-Bongkol has a population of 1,512 consisting of 823 males and 689 females. It is within the 409.42-hectare Adopt-A-Mangrove Forest Area (AMA) project. (See Figure 2).

Figure 2. Map of the Adopt-A-Mangrove Project.

Figure 3. Map of the province of Palawan (inset) showing the location or Bataraza Palawan.

IX. RESULTS AND DISCUSSION

Terrestrial Flora

Description of sampling locations

Sampling and assessment of the mangrove and its associated species in Sitio Bongkol-Bongkol, and Rio Tuba River were conducted and plots were established randomly measuring 10m x 10m, along Rio Tuba River and mangrove area of Sitio Bongkol-Bongkol. (Gaia South Inc., 2024) Each plot was subdivided using four cardinal directions, such as subplot 1 (NE), subplot 2 (SE), subplot 3 (SW), subplot 4 (NW). (Gaia, 2024) By using this approach, duplicate counting was prevented and a methodical inventory and assessment process was ensured. Within the 10m x 10m plot, a smaller quadrant measuring 5m x 5m, and 1m x 1m were also established. (See Appendix A)

Mangrove Species Composition at the Study Site

Based on the result of the study conducted by Gaia South Inc., in March 2024, a total of three (3) mangrove species were recorded from Rio Tuba, Bataraza, Palawan, namely; *Rhizophora apiculata*, *Rhizophora mucronata*, and *Ceriops tagal*. This represents tree (3) true value mangrove species from one (1) family and two (2) genera. (Table 1)

Bakawan lalaki or bakhaw lalaki (*Rhizophora apiculata*) is the dominant tree species in the area with an estimated density of 980 individual plants per hectare. Bakawan babae or bakhaw babae (*Rhizophora mucronata*) and nilad-like (*Ceriops tangal*) were the secondary species with lower densities compared to bakawan lalaki. Bakawan babae has a density of 20 trees per hectare, while nilad-like had a similar value with an estimated density of 20 plants per hectare (Table 2).

Table 1

Mangrove species composition in Rio Tuba

Family	Scientific Name	Local Name	Description
Rhizophoraceae	*Ceriops tagal*	Tangal; tungog; Tagasa	Small trees reaching 6m located at firm sandy to muddy substrate. (Figure 4) Leaves are yellowish green when in sunlight. (Figure 5)
	Rhizophora apiculata	Bakawan lalaki; bakhaw lalaki	Medium to tall tress reaching 20m located at low to mid-intertidal to marine. (Figure 6) Leaves are narrow, and propagules are straight & cylindrical. (Figure 7)
	Rhizophora mucronata	Bakawan babae; bakhaw babae	Medium to big tress reaching 15m to 30m located at low to mid-intertidal marine to estuarine. (Figure 8) Leaves are broadest, light green, & cylindrical. (Figure 9)

Note: Adapted from Handbook of Mangroves in the Philippines – Panay. by Primavera J.H., R.S.Sadaba, M.J.H.L Lebata and J.P Altamarino, 2004, p 106. Copyright 2004 by SEAFDEC Aquaculture Department, Iloilo, Philippines

Figure 4. Trees of *Ceriops Tagal.*

Figure 5. Leaves of *Ceriops Tagal.*

*Source: Coral Bay Nickel Corporation

* Source: Primavera J.H., R.S.Sadaba, M.J.H.L Lebata and J.P Altamarino. Page 44 of Handbook of Mangroves in the Philippines – Panay

Figure 6. Trees of *Rhizophora apiculata.*

Figure 7. Propagules of *Rhizophora apiculata.*

*Source: Coral Bay Nickel Corporation

* Source: Primavera J.H., R.S.Sadaba, M.J.H.L Lebata and J.P Altamarino. Page 62 of Handbook of Mangroves in the Philippines – Panay

Figure 8. Trees of *Rhizophora mucronata.*

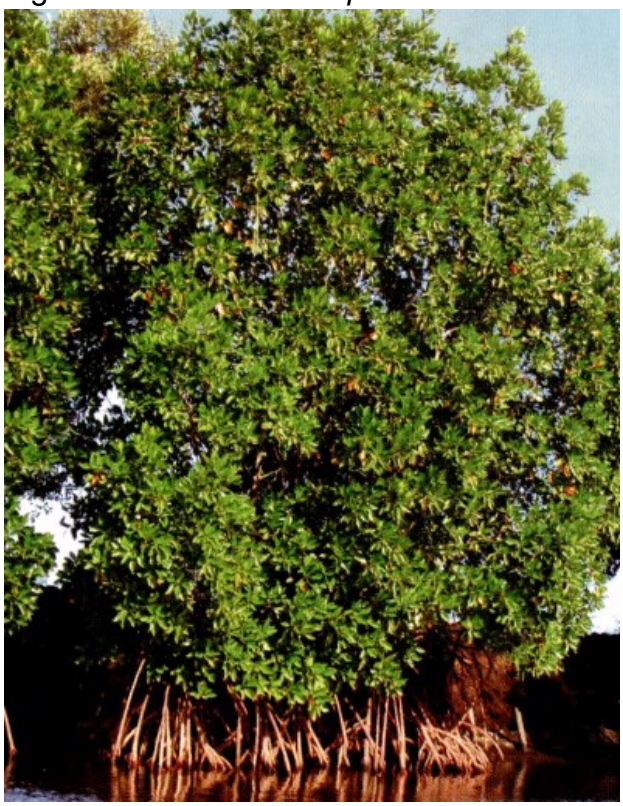


Figure 9. Leaves and propagule of *Rhizophora mucronata.*

*Source: Coral Bay Nickel Corporation

* Source: Primavera J.H., R.S.Sadaba, M.J.H.L Lebata and J.P Altamarino. Page 66 of Handbook of Mangroves in the Philippines – Panay

Table 2

Density and importance value of tree species in the canopy strata of mangrove ecosystem in Sitio Bongkol-Bongkol

Species	Density (per ha)	Importance value (IV)
Ceriops tagal	20	17.41
Rhizophora apiculata	980	264.02
Rhizophora mucronata	20	18.58

Note: Adapted from 1st Draft CBNC's Environmental Performance Report and Management Plan. by Gaia South, Inc., 2024.

Other vegetation observed at the Study Site

Some species were also observed and identified in the different strata of the Riparian Ecosystem as listed in Table 3 albeit they are not specifically mentioned on that study of Gaia South. From the study, the vegetation along the river is dominated by balinghasai or *Buchanania arborescens* in the canopy strata with a density of 100 individuals per hectare, while the second notable species was salingogon or *Cratoxylum formosum* with an estimated density of 250 individuals per hectare.

Table 3

Density and importance value of tree species in the canopy strata along the riparian ecosystem in Rio Tuba River.

Common Name	Species	Density (per ha)	Importance value (IV)
Balinghasai	*Buchanania arborescens*	100	56.54
Salingogon	*Cratoxylum formosum*	250	51.40
Hairy-leaf molave	*Vitex pinnata*	100	31.30
Dalinsi	*Terminalia pellucida*	50	30.20
	Glochidion coronulatum	150	27.91
Malakatimon	*Dillenia luzoniensis*	100	21.47
Pasi	*Elaeocarpus cumingii*	100	20.64
Anabiong	*Trema orientalis*	50	16.44
Tiágkot	*Archidendron clypearia var.clypearia*	50	15.74
Basa	*Carallia borneensis*	50	14.23
Anilau	*Colona serratifolia*	50	14.13

Note: Adapted from 1st Draft CBNC's Environmental Performance Report and Management Plan. by Gaia South, Inc., 2024.

Diversity

In the study site, the overall Shannon Diversity Index ("H") of the mangroves and riparian ecosystem are 1.19, and 2.24, respectively (Table 4). The diversity index measures the species diversity in a particular area, and provides more information about a community's composition. Based on the 1998 Fernando biodiversity scale, the diversity index for each ecosystem varies from high to low. A high diversity index means that this ecosystem supports many species and has the ability to withstand some environmental impacts.

Table 4

Overall diversity indices of the mangrove ecosystem and riparian ecosystems of the study area

Ecosystem	Species Richness	Shannon's Diversity Index (H")	Relative value
Mangrove	3	1.19	Low
Salingogon	28	2.24	Moderate

Note: Adapted from 1st Draft CBNC's Environmental Performance Report and Management Plan. by Gaia South, Inc., 2024.

The diversity index of the mangrove area is very low in the recently conducted study by Gaia South, Inc. Bakauan lalaki had the highest importance value in the mangrove ecosystem. The density of this species is 980 individuals per hectare in the canopy strata. This means that the current ecosystem supports only a few species as evidenced by the data that only three (3) species grow.

The reason for this could be the use of mangrove trees in house construction due to its quality and length of timber, the trees able to reach 15m to 30m high. This was supported by the study conducted by Lahjie, et al., in 2019 whereby *Rhizophora apiculata* is the species preferred due to its characteristics of having a solid, sturdy and heavy wood, and used for furniture, charcoal, and wood chips.

In each of the observation plots in Rio Tuba, Bataraza, Palawan, the number of *Rhizophora apiculata* is found more than *Rhizhopora mucronata* and *Ceriops tagal*, hence, the result is in the high importance value of 264.02. In a more recent study

made by Henri, et al in 2022, the species *Rhizophora apiculata* has the quality to grow fast becoming the dominant species due to it having a type of seed which can germinate while the fruit is still linked to its parent tree. This is the reason behind the fast spread and growth of this species.

In the riparian ecosystem, there is a moderate level of species diversity and evenness in the ecosystem. The riparian ecosystem in the canopy strata only has 10 species but the number of individuals of each species in the riparian ecosystem ranges from 50-250 individuals.

Terrestrial Fauna

Description of sampling locations

In the same study conducted by Gaia, transect lines were made and wildlife observations were established to confirm other existing species. The transect line has a length ranging from 1km to 2km with two (2) or more habitats.

Actual sighting using a binocular, and cameras was performed by the Fauna specialist. Opportunistic sampling, as well as the use of bioacoustics, and the identification of species through its calls were also employed. Other methods used by the specialist were: a) live cage traps b) mist netting c) ethnobiology and; d) other available references and secondary materials.

Fauna species at the Study Site

Record from the study conducted by Gaia South showed a total number 80 species constituting six (6) species of amphibians (Table 5), 56 bird species of avian fauna (Table 6), 10 mammals belonging to seven (7) families (Table 7), and eight (8) species of reptiles (Table 8).

Table 5

List of amphibians identified in Rio Tuba

Species	Family	Common Name
Ingerophrynus philippinicus	Bufonidae	Palawan Toad
Limnonectes acanthi	Dicroglossidae	Busuanga Wart Frog
Occidozyga laevis	Ranidae	Puddle Frog
Pulchrana moelledorffi	Ranidae	Culion Frog
Sanguirana sanguinea	Ranidae	Calamianes Frog

Note: Adapted from 1st Draft CBNC's Environmental Performance Report and Management Plan. by Gaia South, Inc., 2024.

Table 6

List of Bird Species identified in Rio Tuba

Species	Family	Common Name
Aegithina tiphia	Aegithinidae	Common Iora
Haliaeetus leucogaster	Accipitridae	White-bellied Sea Eagle
Alcedo atthis	Alcedinidae	Common Kingfisher
Todiramphus chloris	Alcedinidae	Collared Kingfisher
Aerodramus palawanensis	Apodida	Palawan Swiftlet
Collocalia marginata	Apodida	Grey-rumped Swiftlet
Collocalia troglodytes	Apodida	Pygmy Swiftlet
Ardea intermedia	Ardeidae	Intermediate Egret
Butorides striata	Ardeidae	Striated Heron
Egretta garzetta	Ardeidae	Little Egret
Ixobrychus cinnamomeus	Ardeidae	Cinnamon Bittern
Artamus leucorynchus	Artamidae	White-breasted Woodswallow
Coracina striata	Campephagidae	Bar-bellied Cuckooshrike
Caprimulgus macrurus	Caprimulgidae	Large-tailed Nightjar
Chloropsis palawanensis	Caprimulgidae	Yellow-throated Leafbird
Orthotomus sericeus	Cisticolidae	Rufous-tailed Tailorbird
Chalcophaps indica	Columbidae	Common Emerald Dove
Geopelia striata	Columbidae	Zebra Dove
Ptilinopus leclancheri	Columbidae	Black-chinned Fruit Dove
Spilopelia chinensis	Columbidae	Eastern Spotted Dove
Corvus enca	Corbidae	Slender-billed Crow
Cacomantis merulinus	Cuculidae	Plaintive Cuckoo

Table 6 (Continued) List of Bird Species in Rio Tuba

Species	Family	Common Name
Phaenicophaeus curvirostris	Cuculidae	Chestnut-breasted Malkoha
Dicaeum australe	Dicaeidae	Red-keeled Flowerpecker
Dicaeum pygmaeum	Dicaeidae	Pygmy Flowerpecker
Prionichilus olivaceus	Dicaeidae	Olive-backed Flowerpecker
Prionochilus plateni	Dicaeidae	Palawan Flowerpecker
Dicrurus leucophaeus	Dicruridae	Ashy Drongo
Lonchura atricapilla	Estrildidae	Chestnut Munia
Lonchura punctulata	Estrildidae	Scaly-breasted Munia
Hirundo javanica	Hirundinidae	House Swallow
Hirundo rustica	Hirundinidae	Eurasian Barn Swallow
Hypothymis azurea	Monarchidae	Black-naped Monarch
Anthus rufulus	Motacillidae	Paddyfield Pipit
Motacilla cinerea	Motacillidae	Grey Wagtail
Copsychus niger	Muscicapidae	White-vented Shama
Cyornis lemprieri	Muscicapidae	Palawan Blue Flycatcher
Cyornis rufigastra ssp *simplex*	Muscicapidae	Philippine Blue Flycatcher
Ficedula platenae	Muscicapidae	Palawan Flycatcher
Aethopyga shelleyi	Nectariniidae	Lovely Sunbird
Anthreptes malacensis	Nectariniidae	Brown-throated Sunbird
Arachnothera dilutior	Nectariniidae	Pale Spiderhunter
Cinnyris jugularis	Nectariniidae	Olive-backed Sunbird
Passer montanus	Passeridae	Eurasian Tree Sparrow
Pandion haliaetus	Pandionidae	Western Osprey
Pellorneum cinereiceps	Pellorneidae	Ashy-headed Babbler
Gallus gallus	Phasianidae	Red Junglefowl
Pitta sordida	Pittidae	Hooded Pitta
Phylloscopus examinandus	Phylloscopidae	Kamchatka Leaf Warbler
Passer montanus	Ploceidae	Eurasian Tree Sparrow
Iole palawanensis	Pycnonotidae	Sulphur-bellied Bulbul
Pycnonotus cinereifrons	Pycnonotidae	Ashy-fronted Bulbul
Aplonis panayensis	Sturnidae	Asian Glossy Starling
Gracula religiosa	Sturnidae	Common Hill Myna
Macronus gularis	Timaliidae	Pin-striped Tit-Babbler

Note: Adapted from 1st Draft CBNC's Environmental Performance Report and Management Plan. by Gaia South, Inc., 2024.

Table 7

List of mammals identified in Rio Tuba

Species	Family	Common Name
Macaca fascicularis philippensis	Cercopithicidae	Philippine Long-tailed Macaque
Maxomys panglima	Muridae	Palawan Spiny Rat
Rattus tanezumi	Muridae	Oriental Black Rat
Cynopterus brachyotis	Pteropodidae	Common Short Nosed Fruit Bat
Eonycteris spelaea	Pteropodidae	Common Dawn Bat
Macroglossus minimus	Pteropodidae	Long-tongued Nectar Bat
Sundasciurus steeri	Sciuridae	Southern Palawan Tree Squirrel
Sus ahoenobarbus	Suidae	Palawan Bearded Pig
Suncus murinus	Soricidae	Asian House Shrew
Paradoxurus hermaphroditus	Viverridae	Asian Palm Civet

Note: Adapted from 1st Draft CBNC's Environmental Performance Report and Management Plan. by Gaia South, Inc., 2024.

Table 8

List of reptiles identified in Rio Tuba

Species	Family	Common Name
Draco palawanensis	*Agamida*	Palawan Flying Lizard
Naja sumatrana	*Elapidae*	Malayan Spitting Cobra
Gekko gecko	*Gekkonidae*	Tokay Gecko
Hemidactylus frenatus	*Gekkonidae*	House Lizard
Malayophyton reticulatus	*Phytonidae*	Reticulated Phyton
Eutropis multifasciata	*Scincidae*	Brown Mabuya
Dogania subplana	*Trionichidae*	Malayan Soft-shelled Turtle
Varanus palawanensis	*Varanidae*	Palawan Water Monitor

Note: Adapted from 1st Draft CBNC's Environmental Performance Report and Management Plan. by Gaia South, Inc., 2024.

Socio-economic profile

Figure 3.7 showed that 32 (53.3%) of the respondents were females while 28 are males (46.7%). Sitio Bongkol-Bongkol as of 2023, has a population of 1,512 consisting of 823 males and 689 females. (Figure 10)

Figure 10. Gender of the respondents' in Sitio Bongkol-Bongkol.

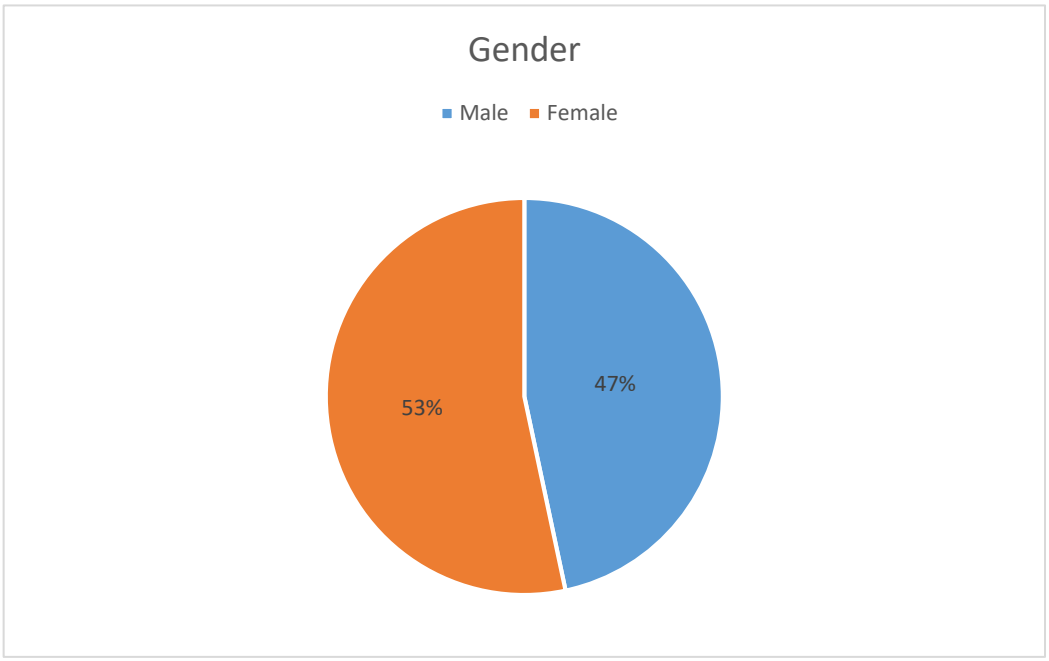
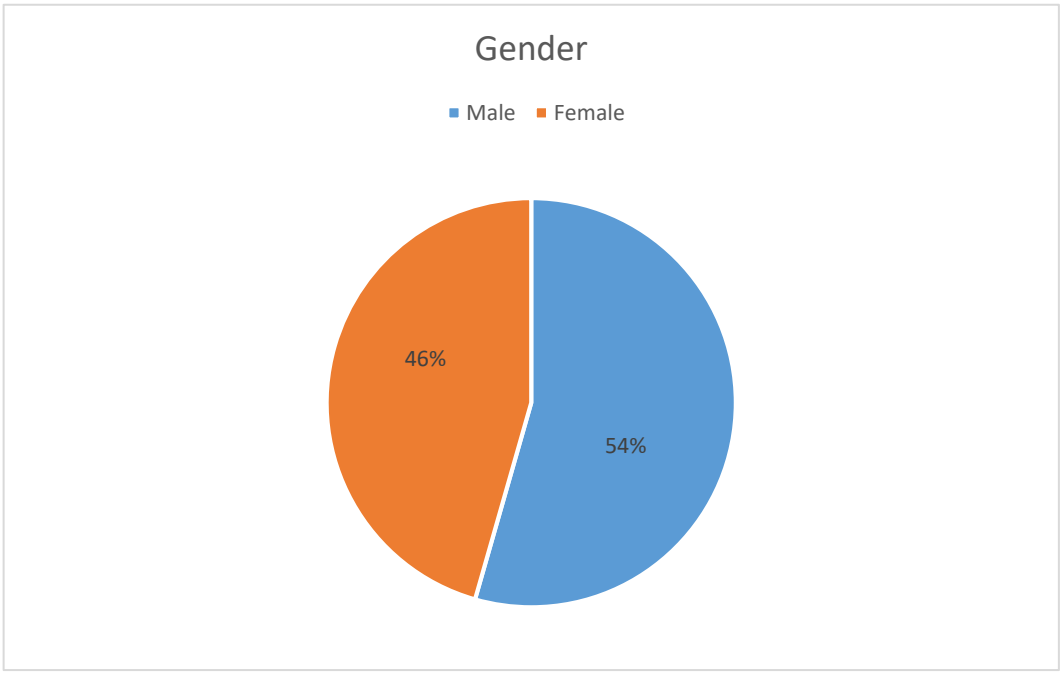


Figure 11. Population of Sitio Bongkol-Bongkol as of 2023.



The age of the respondents is higher for the range of 30-40 years old (30%) followed by 41-55 years old (25%) and above 56 years old (25%), while 19-29 years old at 15%, and 5% for age 18 years old and below. (Figure 12)

Figure 12. Age of the respondents' in Sitio Bongkol-Bongkol.

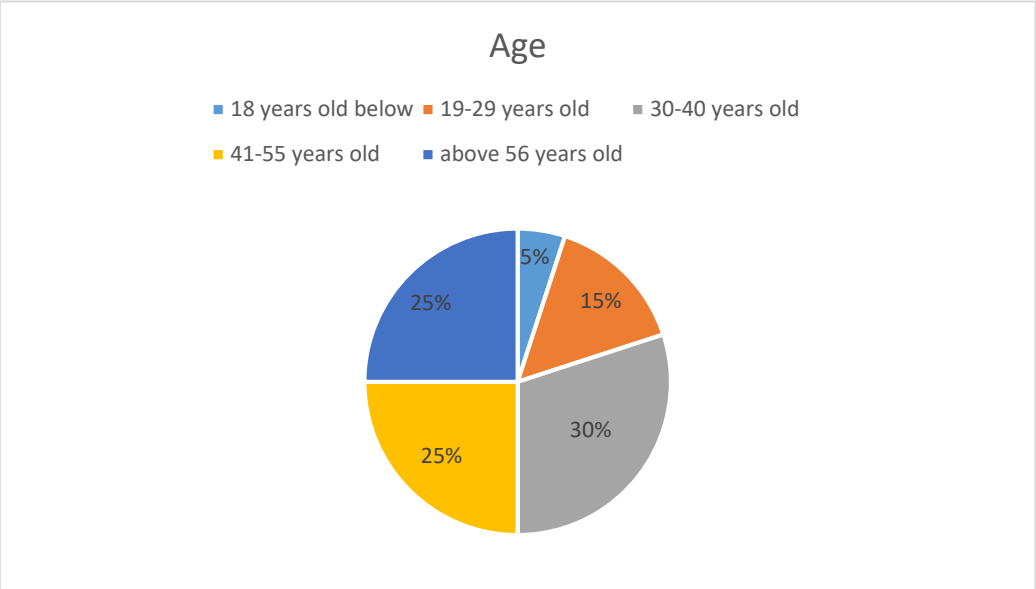
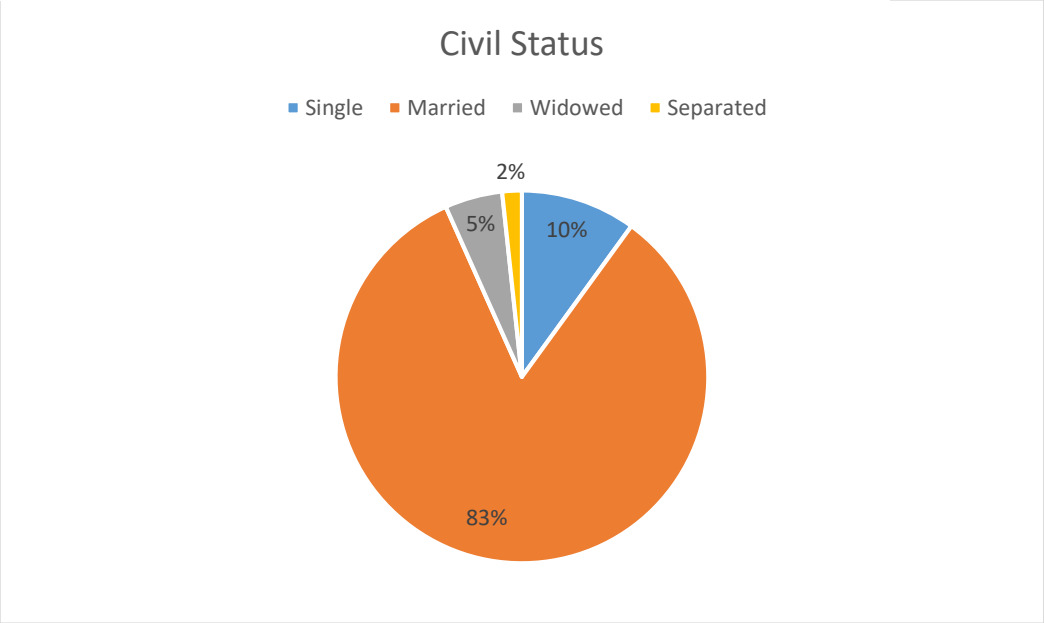


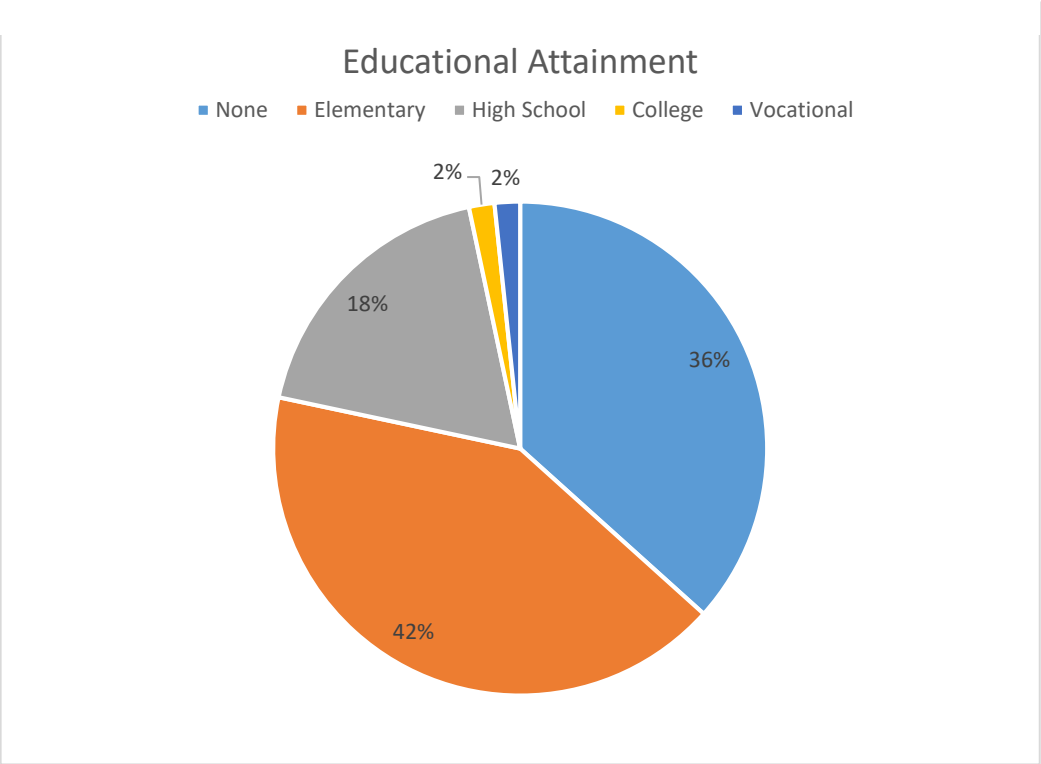
Figure 13 shows that majority (83.3%) of the respondents are married, and only a few are single (10%). 5% are widowed, while 1.7% are separated from their spouse.

Figure 13. Civil Status of the respondents' in Sitio Bongkol-Bongkol.



Most of the respondents' educational level is elementary school graduates (41.7%) followed by those with no proper education (36.7%), while 18.3% (11 persons) reached High School. The latter is because of the Indigenous Learning System (ILS) provided by CBNC. Both college and vocational level graduates at 1.7%. (Figure 14)

Figure 14. Educational attainment of the respondents' in Sitio Bongkol-Bongkol.



On their religion profile (Figure 15), more than half of the respondents are Islam (60%), followed by Christians (36.7%), and then by those not practicing any religion (3.3%).

The regional groupings or tribes (Figure 16) of the respondents' is higher for IP Pala'wan (35%) followed by IP Pangutaran (26.7%), and at IP Mapun (25%). These are followed by IP Molbog (5%), Tausug (5%), and others (3.3%).

This implies that the community of Sitio Bongkol-Bongkol is predominantly a Muslim area and are Indigenous People with various regional groupings.

Figure 15. Religion of the respondents' in Sitio Bongkol-Bongkol.

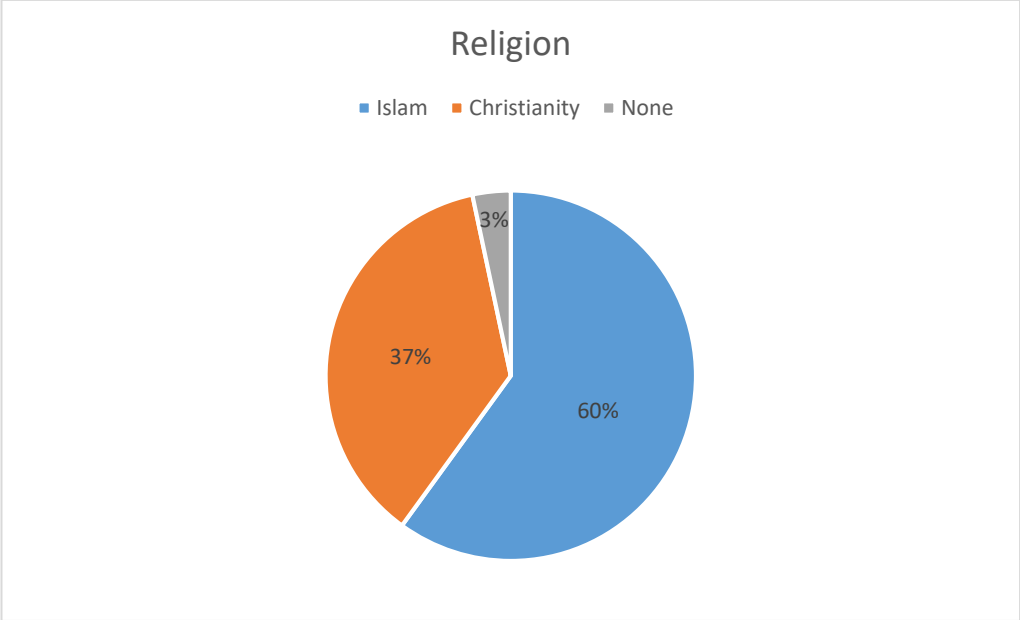
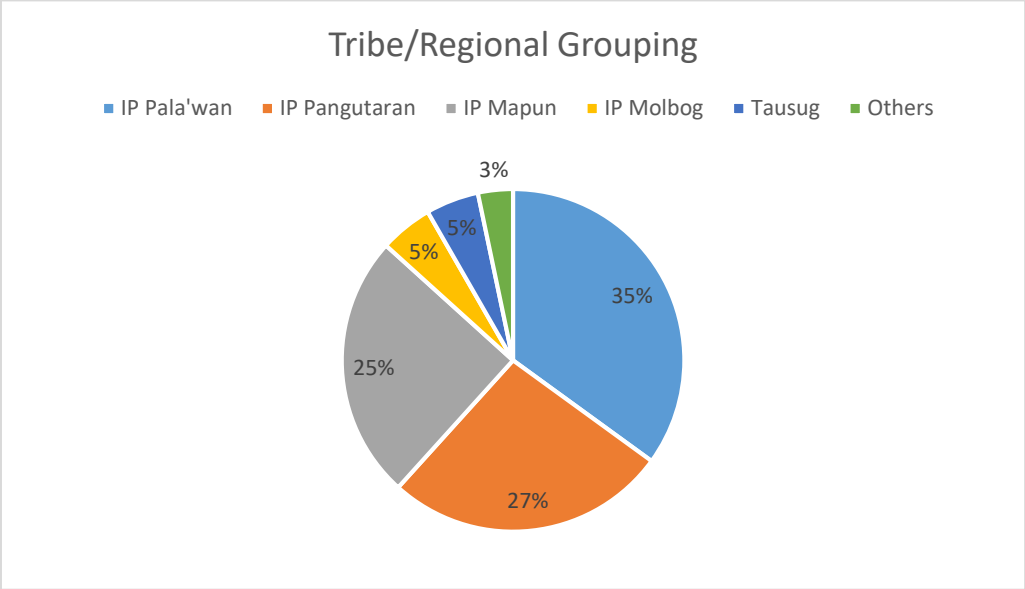
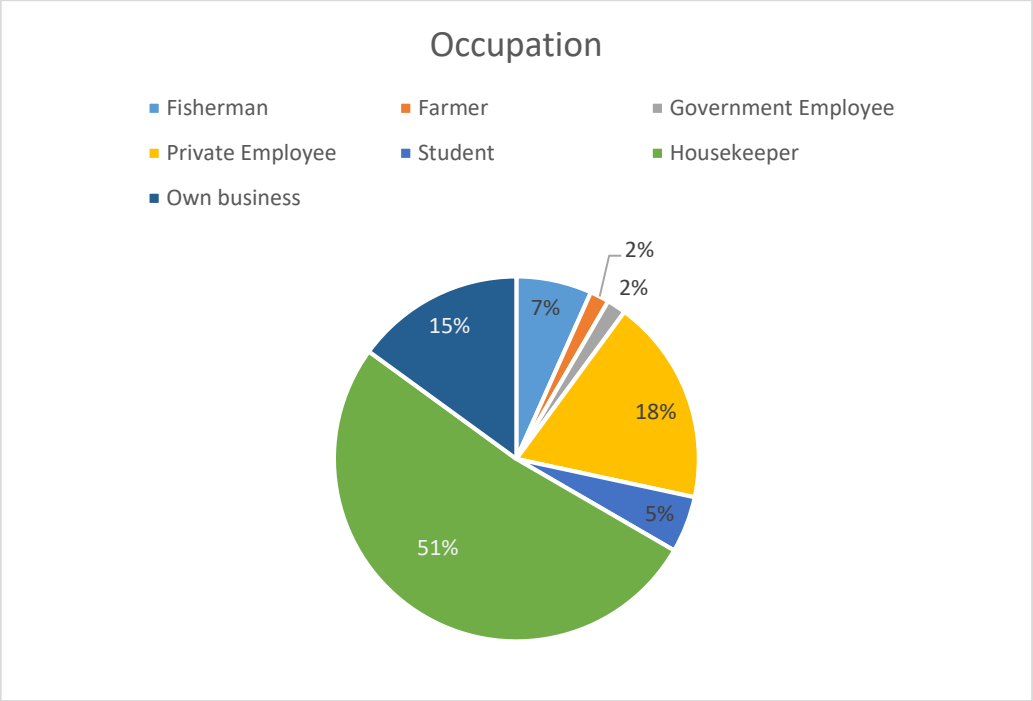


Figure 16. Tribal group of the respondents' in Sitio Bongkol-Bongkol.



On their occupation profile (Figure 17), 51.7% of the respondents answered "*no source of income*" or mainly housekeeper, private employee at 18.3%, while 15% of them owns a business. 6.7% of respondents are fishermen, while 5% are students. Meanwhile, 1.7% answered that their occupation is farming, and works as a government employee.

Figure 17. Occupation of the respondents' in Sitio Bongkol-Bongkol.



Most of the respondents (65%) in Sitio Bongkol-Bongkol have income lower than Php 5,000 (65%), 21.7% earn between Php 5,001 and Php 10,000, while 11.7% earn between Php 10,001 and Php 15,000. (Figure 18)

The range of income is supported by data that 60% of the respondents' answered that no one from their household members works in Rio Tuba Nickel Mining Corporation (RTNMC) or Coral Bay Nickel Corporation (CBNC), or any of their contractors, while 40% responded that they have family member working in either RTNMC or CBNC. (Figure 19) The absence of income of the 50% of the respondents can be due to the individuals' low educational level of attainment at 41.7% and 36.7% respectively, with latter reaching elementary level, and the previous, with no proper education. Conversely, data shows those with household or family members working either in RTNMC, CBNC or any of their contractors, meaning that they have high educational levels to be qualified as employees, have incomes ranging from Php 10,001 to Php 15,000.

Figure 18. Income of the respondents' in Sitio Bongkol-Bongkol.

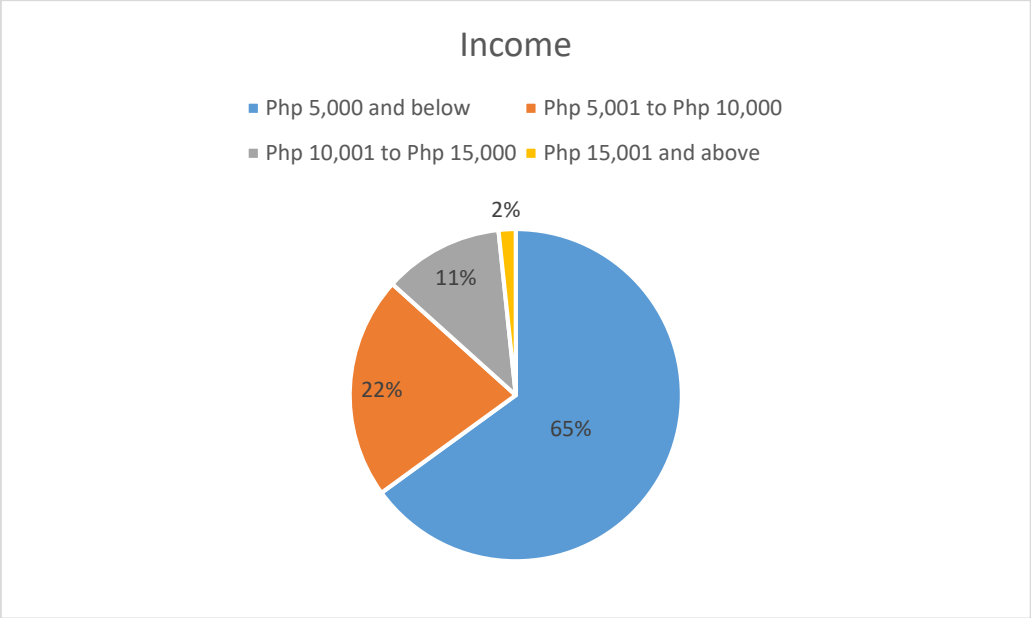
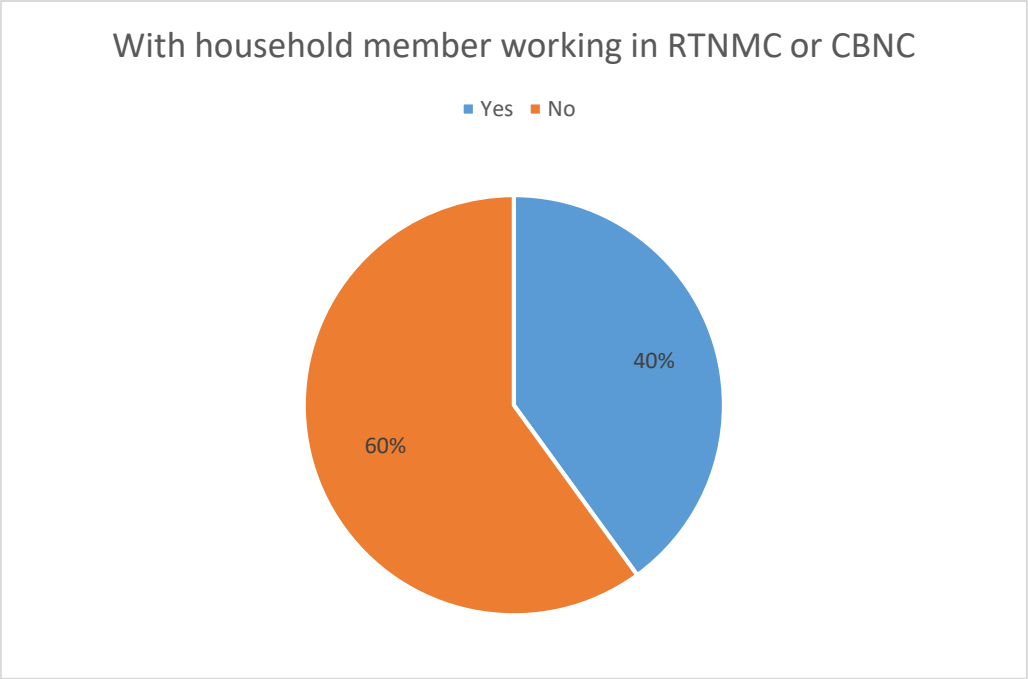


Figure 19. Household member employed at RTNMC or CBNC.



On the proximity of respondents (Figure 20) with the mangrove forest: More than half have their houses less than 500 meters from the mangroves (58.3%), and more than half (66.7%) of them have lived in the same area for more than 20 years. (Figure 21) Data shows that the communities' distance from the mangrove forest has

correlation with the use of mangrove trees as construction materials (Figure 22), due to its accessibility.

Figure 20. Distance from the mangrove area of the respondents.

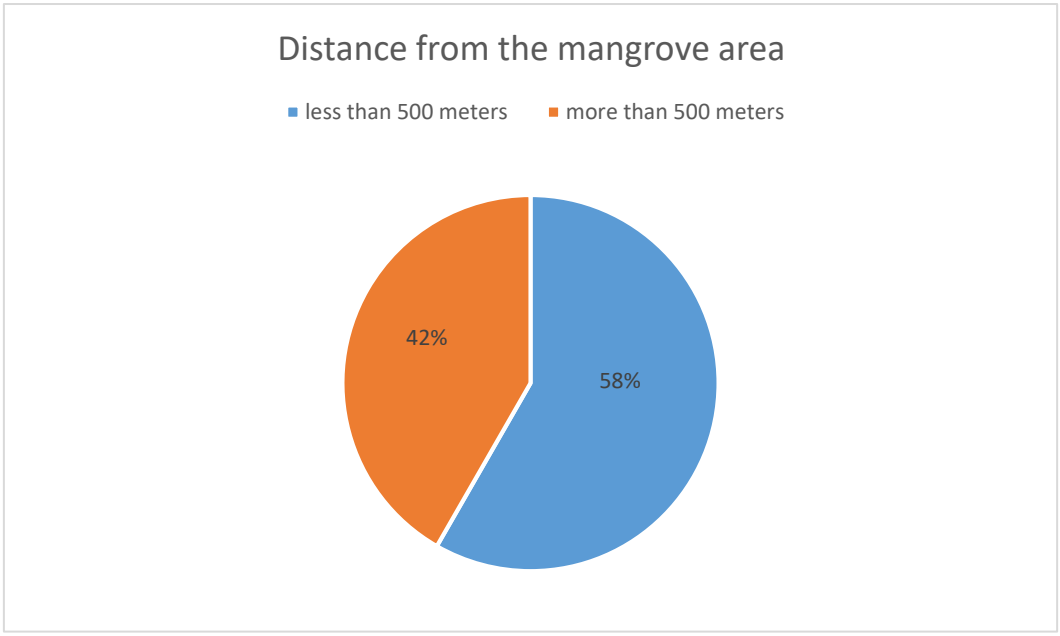


Figure 21. Years of residency of the respondents' in Sitio Bongkol-Bongkol.

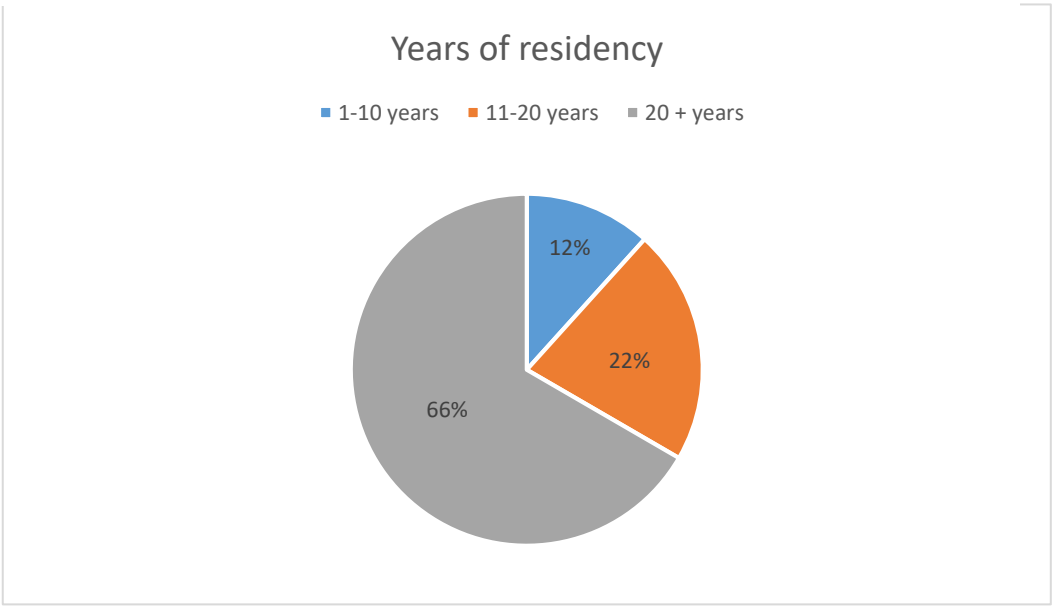


Table 9 shows the summary of socio-economic profile of the respondents.

Table 9

Socio-economic profile of the 60 respondents

Characteristics		Frequency	Percentage (%)
Gender			
	Male	28	46.7
	Female	32	53.3
Age			
	18 years old below	3	5
	19-29 years old	9	15
	30-40 years old	18	30
	41-55 years old	15	25
	above 56 years old	15	25
Civil Status			
	Single	6	10
	Married	50	83.3
	Widowed	3	5
	Separated	1	1.7
Educational Attainment			
	None	22	36.7
	Elementary	25	41.7
	High School	11	18.3
	College	1	1.7
	Vocational	1	1.7
Religion			
	Islam	36	60
	Christianity	22	36.7
	None	2	3.3
Tribe/Regional Grouping			
	IP Pala'wan	21	35
	IP Pangutaran	16	26.7
	IP Mapun	15	25
	IP Molbog	3	5
	Tausug	3	5
	Others	2	3.3
Occupation			
	Fisherman	4	6.7
	Farmer	1	1.7
	Government Employee	1	1.7
	Private Employee	11	18.3
	Student	3	5
	NGO	0	0
	Housekeeper	31	51.7
	Own business	9	15
Income			
	Php 5,000 and below	39	65
	Php 5,001 to Php 10,000	13	21.7
	Php 10,001 to Php 15,000	7	11.7
	Php 15,001 and above	1	1.7
With household member working in RTNMC or CBNC			
	Yes	24	40
	No	36	60
Years of residency			
	1-10 years	7	11.7

	11-20 years	13	21.7
	20 + years	40	66.7
Distance from mangroves			
	less than 500 meters	35	58.3
	more than 500 meters	25	41.7

Figure 22. Example of a house with mangroves used as housing material.

Sitio Bongkol-Bongkol level of knowledge on the conservation of mangroves

Figure 23 indicates the result of having a learning place about mangroves. 62% of the respondents learned about mangroves from others, such as IEC or the Information Education and Communication Campaign (IEC) of CBNC and RTNMC and other entities, followed by family and friends 23%, through the school (7%), and mass media (3%). The remaining 5% of the respondents declined to answer. This implies that the information dissemination conducted by the two (2) companies create awareness on the importance of mangroves. According to the respondents the information on

environmental protection, tree planting, and rehabilitation had been integrated in the IEC of CBNC. Records of CBNC's IEC activities infer that it actively participates in informing the public about the events that took place throughout the planning and consultation phases.

Figure 23. Respondents' statement on the learning place about mangroves.

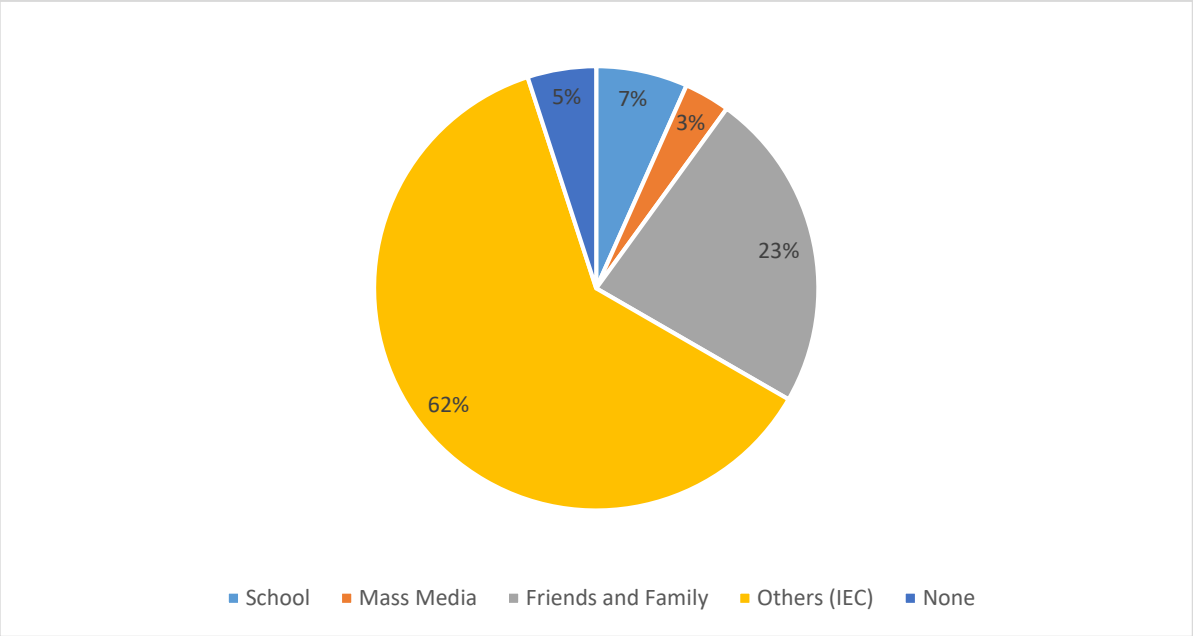


Table 10 presents the respondents' view on mangroves as important to the fisherfolks and economy sector; their knowledge that it acts as buffer against strong winds, waves, and beach erosion, as well as the results if mangroves are not conserved and protected.

The respondents are very familiar on the relevance of mangroves, and the majority (95%) of them agreed on the importance of mangroves to the coastal community, the fisherfolks, and economy sector. The remaining 5% of missing value was due to some respondents did not answer the question. Most of the respondents said that their knowledge on mangroves were due to the awareness campaign (IEC) being conducted by RTNMC and CBNC for year

Table 10

Respondents' view on the importance of mangroves

	Response	Frequency	Percentage (%)
Mangroves are important to the fisherfolks and the economy sector			
	Yes	57	95
	No	0	0
	Missing	3	5
Mangroves act as buffer against wind, waves, and erosion			
	Yes	57	95
	No	0	0
	Missing	3	5
Mangroves face serious threat if not conserved			
	Yes	57	95
	No	0	0
	Missing	3	5

Perception of Sitio Bongkol-Bongkol in the Adopt-A-Mangrove Program

On the community awareness on the Adopt-A-Mangrove Project. Table 11 shows the result of the post survey questionnaire. The respondents' awareness and support to AMA is high at 78%, while 17% claimed not knowing and are not willing to support AMA, and 5% mentioned that they might support AMA. The level of awareness to the project was due to several meetings, workshops and IEC conducted by Coral Bay Nickel Corporation beginning September 2023 (Figure 24).

Table 11

Respondents' level of awareness and support to the Adopt-A-Mangrove (AMA) Program

Response	Frequency	Percentage (%)
Are you aware of the program, and will you support it?		
Yes	47	78
No	10	17
Maybe	3	5

Figure 24. IEC to Barangay Rio Tuba at Sitio Marabahay conducted last March 6, 2024.

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Table 12 presents the perception of the community if the project will be a success or not. Majority of the respondents' believed that the project will be successful at 95%, while 5% were not sure. It is noteworthy that the community believe that the CBNC's financial aid to AMA will continue indefinitely by means of various livelihood projects related to the Adopt-A-Mangrove Program. This result is supported by data during the KII where informants said that AMA will be successful with the support of CBNC.

Table 12

Respondents' perception if the program will be successful

Response	Frequency	Percentage (%)
Will the project be successful?		
Yes	57	95
No	0	0
Maybe	3	5

Table 13 presents the respondents' perception if the program can be sustainable without the presence or support of Coral Bay Nickel Corporation. Majority of the respondents' (82%) believed that the program won't be sustainable without the assistance from the company. This is supported by the data in the Key Informant Interviews. Only 18% of the respondents believed that AMA can stand on its own even without the support of the company. However, until now, they are dependent on CBNC. They believe that the local government's budget is not sufficient enough to sustain the project.

Table 13

Respondents' perception on the sustainability of the program

Response	Frequency	Percentage (%)
Can the program standalone once given to the community or People's organization after 5 years without the support of Coral Bay Nickel Corporation?		
Yes	11	18
No	49	82

Human-resource interaction

As part of the Adopt-A-Mangrove Project initiative of Coral Bay Nickel Corporation, the researcher conducted key informant interviews with the IP leaders, church leaders, (Muslims and Christians), Barangay Rio Tuba Councilor, person-in-charge (PIC) for the Environment, and the representative of the BLGU Patrol Group. The PIC of Coral Bay Nickel Corporation's AMA Project, and some employees at CENRO Brooke's Point were also interviewed. Key informants were asked loosely structured questions, relying on the survey questionnaires to allow free flow of ideas.

Meanwhile, the researcher combined the conduct of Focus Group Discussion with the conduct of survey. This is to allow the researcher to collect data from diverse groups of people of Sitio Bongkol-Bongkol within a short time span, in addition to the responses/data from the Key Informants.

Support to the Adopt-A-Mangrove Project

The respondents recognize the importance of having the AMA of Coral Bay Nickel Corporation (CBNC) for the community. They have knowledge that mangroves protect the coastline from erosion, and act as buffer against strong winds and storm surges during typhoons. They believe that CBNC is helping them to generate income from the livelihood brought about by putting up the AMA Project. The livelihood resulted from the mangroves was supported by one of the respondents. According to the informant the roots of mangroves serve as the spawning ground and nursery area for small marine species like crabs and shrimps that facilitated the respondent's crab fattening project (Figure 25).

Oo naman. Kung wala yang mga bakawan, ang lakas ng hangin dito galing sa dagat. Dahil na din sa bakawan ay meron akong crab fattening – IP Chieftain

"Malaking tulong ang programa na yan ng CBNC, marami din ang matutulungan dahil sa mga posibleng livelihood. Ang mga ganitong proyekto ng kompanya ay malaking bagay para sa ikakaunlad ng Rio Tuba" – Rio Tuba Patrol Representative

"Suportado ko ang proyekto kung para sa pangabuhayan dahil kami ang makikinabang" – Religious Leader 2

Figure 25. Crab Fattening project at Sitio Bongkol-Bongkol.

Sustainability and successfulness of the Project

The key informants have responded in a positive way on the sustainability and success rate of the project. The respondents believed that the mangrove restoration will definitely be successful because of CBNC's long term commitment to the community, and given the track record of CBNC in supporting community-based projects. However, some respondents were hesitant of the AMA citing the result of the previous projects conducted for an IP Community in the area. They believed that the success of the mangrove rehabilitation depends on who will be represent the project in Sitio Bongkol-Bongkol as partner of CBNC in producing quality mangrove propagules to be used as planting materials. A number of the informants believed that without CBNC, the project cannot be sustained, citing financial matters, and the absence of the livelihood projects if CBNC is not involved. The researcher learned that in addition to the usual benefits given by the company to the community thru the Social Development and Management Program (SDMP), some religious leaders received financial assistance thru the Corporate Social Responsibility or CSR of CBNC.

"Magiging successful yan, basta CBNC." – Religious Leader 1

"Bakit naman hind maging successful ang proyekto? Ito ay lalago dahil para na rin sa kalikasan. Ang importante ay magtulungan lang sa pag monitor nito para mabawasan yung pagputol ng mga bakawan" – Rio Tuba Patrol Representative

"*Ang problema dyan ay, nagsasayang lang ng pera ang kompanya nyo."* – Rio Tuba Councilor

"Bakit naman bibitawan ng CBNC ang project kapag tapos na? Mahirap naman yun at kung sakali man mawawalan din ng hanapbuhay ang mga umaasa sa nakukuha sa bakawan" – Religious Leader 2

"Kaya naman po kahit wala ang kompanya, kaso mabagal."

Perceived issues and challenges in the implementation of the Project

When asked about the challenges in the implementation of the project, the respondents said that tree cutting of mangroves for construction (Figure 26) for firewood are among the perceived reasons that could hamper the implementation of

the project. Other informants said that mangrove trees were also being cut and sold as lumber; and some said that in the past years, cutting of mangroves to extract sap for dyeing was rampant in the area. Albeit they said that this latter practice had stopped. It is noteworthy that there had been no incidents where the mangroves in Sitio Bongkol-Bongkol were cleared for conversion into fishponds and other aquaculture activities, like that have been done to some parts of the mangroves in Barangay Ocayan. When asked what other factors can delay the implementation of the project, informants said that the inadequate support of other stakeholders and lack of community involvement in program implementation. These relates to the concern of sustainability of the project after the 5-year program (and support) of CBNC are finished.

"Pinuputol yung bakawan para may pang construct ng bahay Meron din namang ginagawang baklad at nag uuling pa rin nito." – IP Chieftain

"Yung iba dito ginagawang pangaka buhayan ang bakawan. Binibenta nila para may kita. Pero kung pambahay, pwede pa. Pag gumamit ng bakawan sa bahay, kuuha ng permisyo sa Chieftain na gagamitin ang 'bakaw' sa bahay" – Religious Leader 2

Figure 26. Image of a house with mangroves used as housing material.

Why the mangrove forests in Sitio Bongkol-Bongkol are being lost?

During the Focus Group Discussion, respondents agreed that cutting of mangrove trees are no longer allowed but there are still violators. Asked why are mangrove forest are being lost in Bongkol-Bongkol, majority of the FGD respondents cited that it's use as a source of livelihood where cut trees are sold as firewood, charcoal, and lumber, while others use it for house construction. The researcher received frank answers from respondents which implies that there is a correlation between poverty incidence in Sitio Bongkol-Bongkol and the mangrove forest utilization.

"Gabi naghahakot at inoorder lang ang pampagawa" – IP Mapun respondent
"Ginagawang bahay" – IP Pala'wan respondent 1
"Pambahay. Hindi sinisira yung malalaki, maliliit lang" – IP Pangutaran respondent 1
"Binebenta ang bakaw." – IP Pangutaran respondent 2
"Binibenta hindi, pero pambahay pwede." – IP Pala'wan respondent 2
"Ginagawang uling at ginagamit pang baklad pero nagpapaalam." – IP Pala'wan respondent 3
"Pwede pambahay, hindi pwede ibenta. Pakalat-kalat na pagkuha pwede." – IP Pala'wan respondent 4

How can mangroves be protected in your area from being lost?

Asked for their suggestions how can mangroves be protected from being cut, the respondents' answers varied depending on their perceptions influenced by characteristics like gender, religion, educational attainment, age, etc. Thus, the support and intervention by concerned agencies and entities to effectively implement the project are needed.

"Taniman yung bakanteng area ng bakaw para yung mga tao hindi magputol ng puno" – IP Pala'wan Respondent 1
"Gwardyahan ang bakawan pero may sahod" – Tausug Respondent

“May bantay dapat sa bakawan at bigyan ng trabaho yung namumutol. Mag rehab” – IP Pala’wan Respondent 2

“Taniman uli.” – IP Pangutaran respondent 1

“Huwag abusuhin ang pagputol.” – IP Pala’wan respondent 3

“Magtanim uli ng bakaw para hindi maubos” – IP Mapun respondent

The 5-Year Plan Adopt-A-Mangrove (AMA)

In addition to the data gathered from the surveys, KII, and FGD, the researcher examined the AMA Strategic Plan.

The AMA Project is part of the Forest Carbon Sequestration Estimation and Emissions Management Program of CBNC to offset the company’s CO2 emissions. This Carbon Sink study concluded that the company needs to have 313 hectares of forest land. CBNC instead opted to adopt a 409.42 ha of mangrove forest in a PLGU-initiated program known as the Adopt-a Mangrove Forest Area Project (AMA). CBNC partnered with the Department of Environment and Natural Resources (DENR-MIMAROPA) through the Provincial Government Environment and Natural Resources Offices (PG-ENRO) to rehabilitate together with Bataraza local government, three mangrove areas in the municipality and at the same time promote livelihood for members of the communities in vicinity of the project sites.

The AMA with National Greening Program (NGP) Site Project is among the strategies adopted to encourage and enhance forest development as well as to improve the survival percentage of NGP plantations. Similarly, with the aim of conserving and protecting the environment and community, CBNC committed to voluntarily assist the government through DENR by enhancing the existing vegetation for the sake of future generations and the sustainability in Barangay Rio Tuba, Bataraza, Palawan in support to the National Greening Program. Hence, the creation of a Technical Working Group (27) composed of different stakeholders and establishment of a Memorandum of Agreement or MOA. The MOA includes the strengthening of protection and conservation schemes of mangrove ecosystems in the area, through improved law enforcement component. In 2023, both parties have

identified 409.42 hectares mangrove areas with graduated NGP sites that needs further enhancement and/or rehabilitation. The projects main objectives are to conduct massive and intensive planting to fight climate crisis; strengthen the monitoring, patrolling, and protection of the identified mangrove sites in the three (3) barangays namely Rio Tuba, Sarong, and Ocayan, Bataraza, Palawan (Figure 28); provide opportunities in terms of sustainable livelihood; and involve and enhance the participation and investment of the private sector to achieve carbon neutrality. The roles and responsibilities of the parties are stated Table 14.

Table 14

Roles and Responsibilities of CBNC and DENR-MIMAROPA

Coral Bay Nickel Corporation	DENR-MIMAROPA
1. Submit a 5-Year Development Plan	1. Support in the preparation of Five-Year Development Plan
2. Lead the creation of a TWG	2. Provide technical assistance in the conduct of plantation maintenance
3. Provide logistics and financial support, conduct of IEC	3. Ensure community part
4. Submit annual report	4. Monitor performance and progress of the AMA

Details of budgets were further presented in the work and financial plan in Figure 29. The projected annual expenses for the project are: year 1 Php 1,653,000; year 2 Php 2,935,000; year 3 Php 3,177,000; year 4 Php 2,127,000; and year 5 Php 2,115,000. The total budget for 5 years is Php 12,000,000.

Figure 27. Adopt-A-Mangrove Implementing Body.

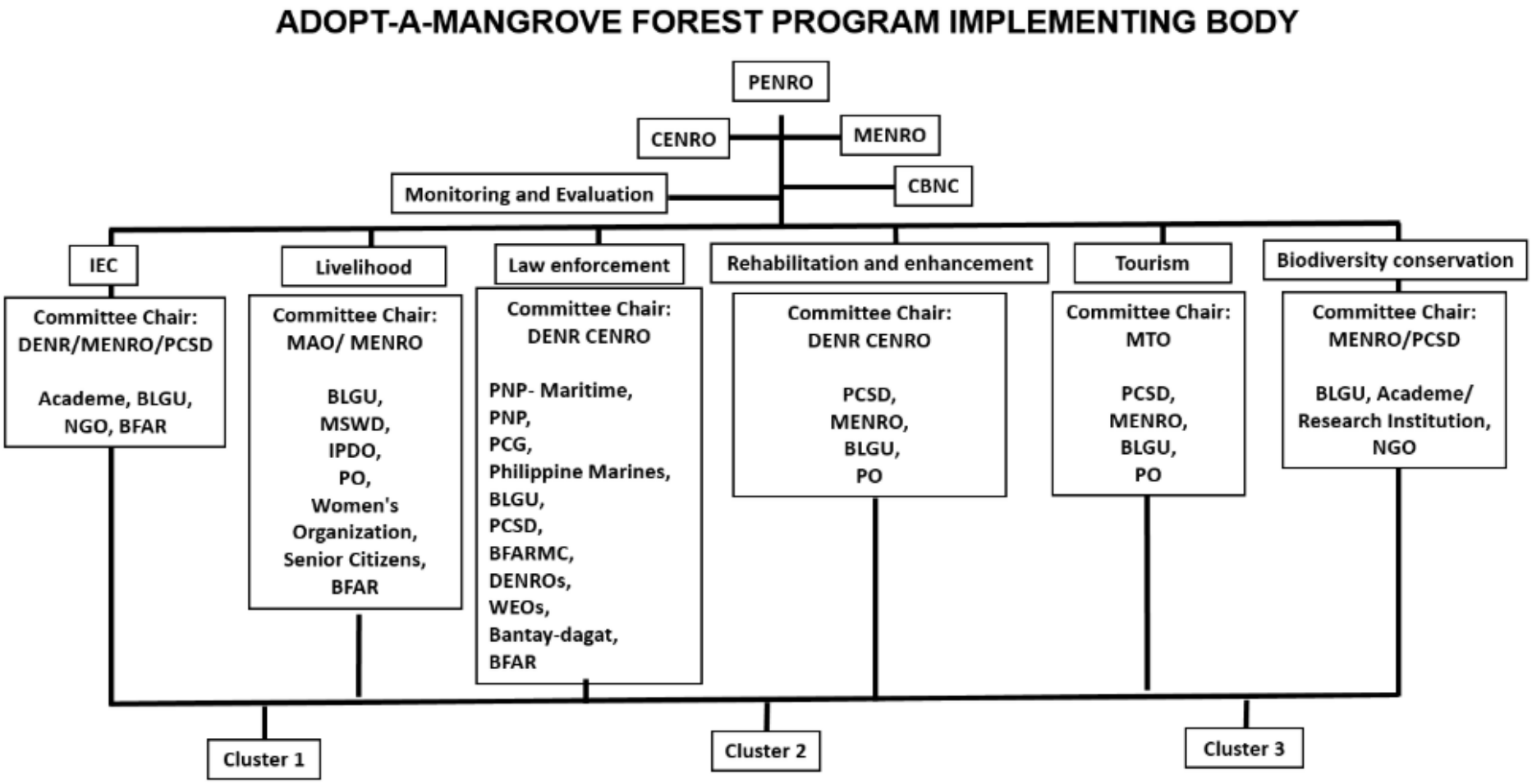


Figure 28. Identified Mangrove Sites.

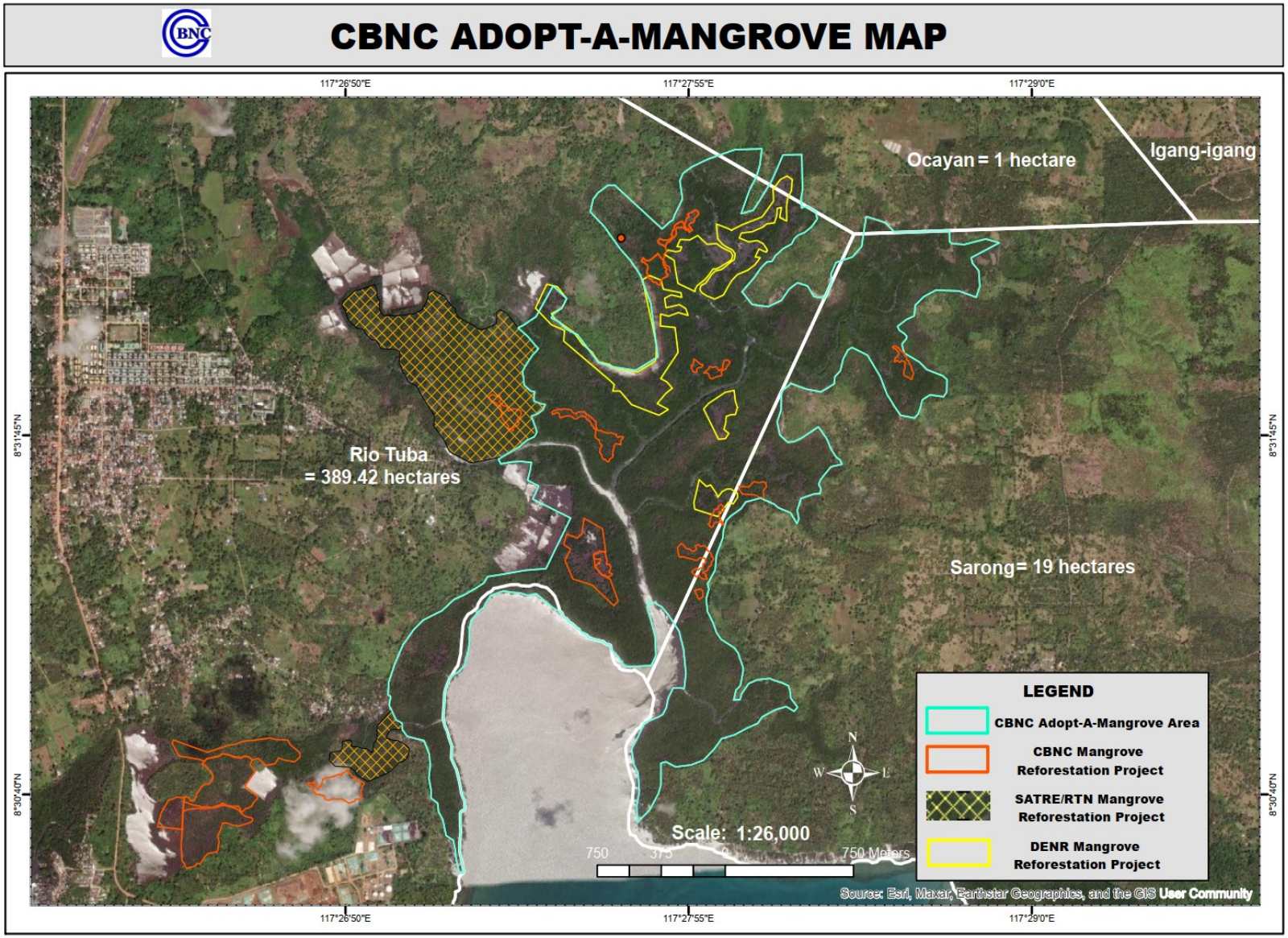


Figure 29. Work and Financial Plan.

Adopt-a-Mangrove Area Program 5-Year Work and Financial Plan

PROGRAM/ACTIVITY/PROJECT	UNIT COST (PhP)	PERFORMANCE INDICATOR	LOCATION	PHYSICAL PERFORMANCE TARGET							FINANCIAL PERFORMANCE TARGET (PhP)						
				Y0	Y1	Y2	Y3	Y4	Y5	TOTAL	Y0	2024	2025	2026	2027	2028	TOTAL
I. PROFILING AND IEC																	
A. Survey, mapping and planning		Creation of 5-year strategic and development plan.	409.42 ha adopted mangrove forest	409.42 ha							230,000.00						
A.1 IEC	15,000/Barangay/quarter	IEC activity in 3 Barangay every quarter.	Riotuba, Sarong, Ocayan		4	2	1	1	1			180,000.00	90,000.00	45,000.00	45,000.00	45,000.00	405,000.00
A.2 Installation of signages	3000/ signage	12 signage installed	409.42 ha adopted mangrove forest		10							30,000.00					30,000
II. FOREST PROTECTION																	
B. Establishment of mangrove monitoring stations	100,000/ monitoring station	monitoring station constructed per cluster.	409.42 ha adopted mangrove forest		1	1	1					100,000.00	100,000.00	100,000.00			300,000.00
B.1 Purchasing of patrol boat	100,000/patrol boat	Provision of 1 patrol boat.				1							100,000.00				100,000.00
B.2 Boat operation and maintenance	30,000/year	Fuel and maintenance of patrol boat for 1 year.				1	1	1	1				30,000.00	30,000.00	30,000.00	30,000.00	120,000.00
B.3 Provision of geotagging and communication device	50,000/ unit	Provision of 1 set of geotagging and communication device per station			1	1	1					30,000.00	50,000.00	50,000.00			130,000.00
B.4 Provision of PPE's	1,000/guard	Provision of 1 set of PPE's per guard.	3 monitoring station		12			12				12,000.00			12,000.00		24,000.00
C. Hiring of community guards	5,000/ month (food allowance/guard)	Provision of monthly allowance per guard.			9	12	12	12	12			540,000.00	720,000.00	720,000.00	720,000.00	720,000.00	3,420,000.00
C.1 Detailed Forest Protection Officer	5,000/month (food allowance/guard)	Provision of monthly allowance per FPO's.	409.42 ha adopted mangrove forest		2	2	2	2	2			120,000.00	120,000.00	120,000.00	120,000.00	120,000.00	600,000.00
III. MANGROVE REHABILITATION AND ENRICHMENT																	
A. Rehabilitation																	
A.1 Planting	15,000/ha	25 hectares of mangrove forest rehabilitated per year	75 hectare rehabilitation area		10	30	35					150,000.00	450,000.00	525,000.00			1,125,000.00
A.2 maintenance and enhancement	3,000.00/ ha					10	40	75	75				30,000.00	120,000.00	225,000.00	225,000.00	600,000.00
B. Enrichment																	
B.1 Planting	15,000/ha	25 hectares of mangrove forest enriched per year	75 hectares enrichment area		10	30	35					150,000.00	450,000.00	525,000.00			1,125,000.00
B.2 maintenance and enhancement	3,000.00/ ha					10	40	75	75				30,000.00	120,000.00	225,000.00	225,000.00	600,000.00
C Nipa and pandan plantation																	
C.1 Nipa Plantation																	
C.1.1 Nipa seedling production	20/seedlings	2 hectares of nipa plantation established	2 hectares nipa plantation area		2,500		5,000					50,000.00		10000			60,000.00
C.1.2 Nipa plantation establishment	6,500.00 / hectare				1		2					13,000.00		26,000			39,000.00
C.2 Pandan Plantation																	
C.2.1 Pandan seedling production	20/seedlings	2 hectares of pandan plantaion es tablished	2 hectares pandan plantation area		2,500		5000					50,000.00		10000			60,000.00
C.2.2 Pandan plantation establishment	6,500.00 / hectare				1		2					13,000.00		26,000			39,000.00
IV. LIVELIHOOD																	
A. Crab fattening	100,000/Peoples Organization	1 crab fattening cage established per year	Riotuba, Sarong, Ocayan		1	1	1	1	1			50,000.00	100,000.00	100,000.00	100,000.00	100,000.00	450,000.00
B. Fish cages & Fish pen	100,000/Peoples Organization	3 fish cage or pen es tablished per PO					1	1	1					100,000	100,000.00	100,000	300,000.00
C. Nipa and Pandan handicrafts (Mat, hat, bag, ect.)	50,000/Peoples Organization	Provision of handicrafts materials per year			1	1	1	1	1			50,000.00	50,000.00	50,000.00	50,000.00	50,000.00	250,000.00
D. Provision of fishing gears	100,000/Peoples Organization	Provision of fishing gears per PO per year					1	1	1					100,000	100,000.00	100,000	300,000.00
E. Mangrove eco-tour	250,000/year	2 eco- tourism facility es tablished.						1	1						300,000.00	300,000	600,000.00
V. RESEARCH AND DEVELOPMENT																	
A. Biodiversity Assessment (Crocodile and other wildlife)	500000/assessment	1 bio-diversity assessment conducted	409.42 ha adopted mangrove forest			1							500,000				500,000.00
B. Land Ecosystem Assessment (Carbon sequestration st	300000/Assessment	1 Land ecosystem assessment conducted					1							300,000			300,000.00
C. Enhancement of natural water source	15,000.00/cluster	2 spring enhanced	2 cluster		1	1						15,000.00	15,000.00				30,000.00
VI. MONITORING AND EVALUATION	100,000/year	Conduct Monitoring and Evaluation every year	409.42 ha adopted mangrove forest		1	1	1	1	1			100,000.00	100,000.00	100,000.00	100,000.00	100,000.00	500,000.00
TOTAL												1,653,000	2,935,000	3,177,000	2,127,000	2,115,000	**12,007,000**

Prepared By:	Attested By:	Noted By:		
Arnel R. Calinga	Randy C. Favila	Jeb.B. Badlon	Antonio O. Sanone	Hideaki Sato
EMQC S Assistant II	Senior Supervisor	EMQC Section Head	EQS Manager	EVP & Plant Manager

Coral Bay Nickel Corporation (CBNC)

Coral Bay Nickel Corporation (CBNC), a mineral processing plant established in 2004, is located in Rio Tuba Export Processing Zone, in Brgy. Rio Tuba, Bataraza, Palawan. CBNC has been a perennial recipient of Best Mining Forest given annually during the Presidential Mineral Industry and Environmental Award in Baguio City, Philippines. This award is not intended for mangrove rehabilitation only, but for company's overall rehabilitation program of planting indigenous trees, mangroves, flowering plants and bamboo, were documented and included in the National Greening Program, and Mining Forest Program being submitted to the Environmental Management Bureau (EMB) & the Mines and Geosciences Bureau (MGB) every quarter. CBNC is also a recipient of the 2019 ASEAN Mineral Awards for its "Best Practices in Sustainable Mineral Development" in the Metallic and Mineral Processing Category given by the Association of Southeast Asian Nations (ASEAN) in Bangkok, Thailand last December 11-13, 2019. The ASEAN Mineral Awards were established to recognize ASEAN mining businesses that have made remarkable contributions to the development of ecologically and socially sustainable minerals throughout the ASEAN region. The practices listed In the ASEAN Mineral Awards include: The contributions to the social and economic development of communities; human resource development and employee welfare; management of health and safety; management of the environment, including the control of emissions, noise and water use, and effluents; conservation of biodiversity; progressive rehabilitation and rehabilitation of examined areas; innovations in materials and processes.

Appendix B lists the environmental awards received by CBNC from the start of its operation.

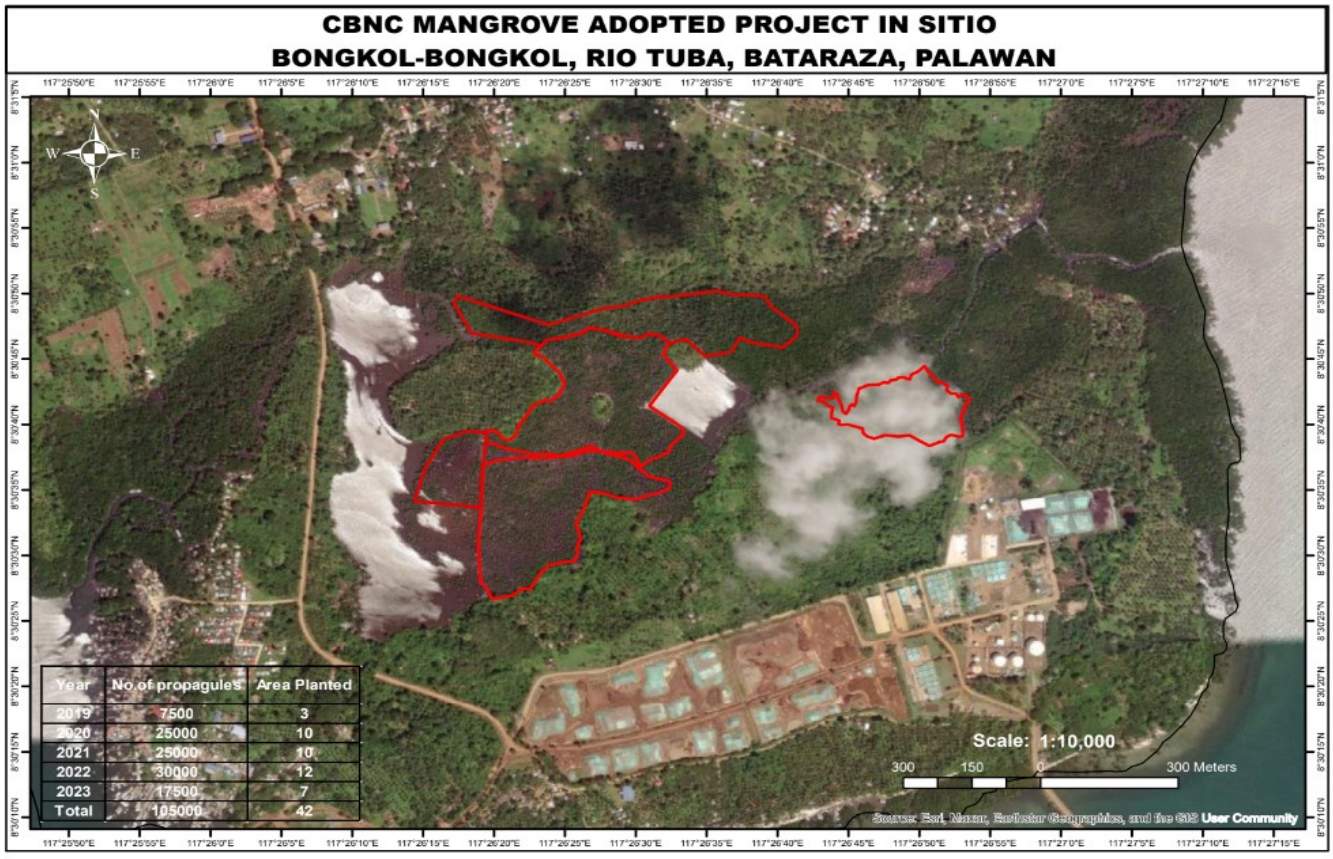
The awards mentioned were due to the past and present efforts of the company in the restoration of the mangrove forests and other areas, such as the continuous replanting of mangroves within the impact areas of CBNC. Table 15 lists the different programs of CBNC on the rehabilitation of mangroves.

Table 15

Different rehabilitation programs of CBNC

Past	Present
1. Mangrove Forest Assessment of Bukid-Bukid, Brgy. Rio Tuba, Bataraza Palawan conducted by ThreeSevens Management Consultancy & Services in February 2021	1. Mangrove Integrated Coastal Resource Management (ICRMP) of Bataraza with CBNC as part of the Technical Working Group - Integrated Coastal Resource Management
2. Establishment of a mangrove reforestation project located at Sitio Bukid-Bukid, Sitio. Bongkol-Bongkol, and Sitio. Marabahay, Brgy. Rio Tuba, Bataraza, Palawan between LGU of Rio Tuba, CBNC, and CENRO Brookes Point in 2022	2. Establishment of the Watershed-Mangrove Biodiversity Conservation (WaMBIC) Program, Bataraza, Palawan Management Practices
3. The company has planted a total of 42-hectare mangrove propagules in Sitio Bongkol-Bongkol as part of the national Greening Program & Mining Forest Program from 2019-2023 (Figure 30s)	3. Continuous rehabilitation effort through the National Greening Program and Mining Forest Program

Figure 30. Map of Sitio.Bongkol-Bongkol Rehabilitation from 2019-2023.



X. RECOMMENDATION AND CONCLUSION

Mangrove restoration and maintenance is understood as costly, time-consuming, mostly involves manual work, and slow process. In the case of the AMA site in Sitio Bongkol-Bongkol, however, the eventual socio-economic benefits to the community are worth the efforts and fund support expended by the concerned government agencies/offices, the Coral Bay Nickel Corporation, and other supporting organizations.

The main challenges to success that were identified in the AMA project are the lack of real-time monitoring and weak law enforcement capabilities. Hence, possible courses of action could be the following:

1) Review/update the existing plan. Give more consideration to the economic activities of the people near the mangroves. The aim is to broaden the mangrove rehabilitation's range of benefits of nearby inhabitants beyond simply being paid for planting and nurturing the mangroves. To be seriously considered are their customs and practices that makes them extract raw mangrove products;
2) Active participation of capable local residents in planning, implementing, and monitoring of the project; as well as harnessing the capabilities of other agencies/entities in terms of their expertise, experience, influence, and track record in efficiently accomplishing community-based projects, and;
3) Establish the roles, delineation of tasks, duties, and responsibilities of each participant of the AMA

Based on the abovementioned courses of action and after conferring with different subject matter experts, the researcher has the following recommendations:

1) Conduct a periodic review of the AMA project. At least quarterly to have assessments that are as current as possible on the state of the mangroves and the effectiveness and efficiency in monitoring the rehabilitation activities and enforcing mangrove protection measures.

2) Invite other agencies/entities as main participants in the AMA. Particularly those that can further help in adding value to a mangrove-based livelihood such as TESDA, DOST, and DTI. The aim is so that the nearby communities can reduce the volume of raw materials that they extract from the mangroves.

In conclusion, creating awareness and active participation of nearby inhabitants in nurturing the mangroves are critical to guaranteeing the sustained, effective and efficient rehabilitation of the mangroves in Sitio Bongkol-Bongkol. Information, education, and communication must be intensified on the mangroves' biophysical and economic services and the consequential risks of cutting trees from mangrove forests. The people of Sitio Bongkol-Bongkol must change their current mindset about the uses of mangrove forests in favor of long-term and sustainable mangrove utilization. The support and intervention by appropriate government agencies and entities are equally critical particularly in the identification and promotion of value-added sustainable livelihood activities instead of just simply extracting raw materials from mangroves. This would reduce the cutting and selling mangrove trees for firewood and charcoal and as housing materials. Stricter monitoring and surveillance of the area, as well as strengthening the enforcement of environmental policies by the LGUs should be done soonest. Altogether, these actions will achieve the desired biodiversity, the protection of shoreline areas of Sitio Bongkol-Bongkol from erosion and storm surges, and that the near shore waters are not polluted by surface runoffs. More importantly, lessons from the success of the AMA shall help enable DENR to replicate the project in other places thereby eventually helping the reduction of carbon emission in the operation of of Coral Bay Nickel Corporation; and in facilitating the works of concerned agencies/entities in developing the socio-economic resiliency of communities near mangroves.

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Appendices

Appendix A

Location of sampling stations

Plot	Northing	Easting	Photo
24 (Rio Tuba River)	$8^0$32'24.8"	$117^0$24'48.8"	
25 (Rio Tuba River)	$8^0$32'24.3"	$117^0$24'50.6"	
26 (Sitio Bongkol-Bongkol)	$8^0$30'49.9"	$117^0$27'2.9"	

Plot	Northing	Easting	Photo
27 (Sitio Bongkol-Bongkol)	8^{0}30'49.4"	117^{0}27'5.9"	
28 (Sitio Bongkol-Bongkol)	8^{0}30'50.2"	117^{0}27'8.2"	

* Adapted from Gaia South, Inc. 2024. 1st Draft CBNC's Environmental Performance Report and Management Plan.

Appendix B

List of Environmental Awards received by CBNC

Date	Award Giving Body	Award
22-Nov-08	MGB - PMSEA 55th Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Awards (PMIEA) Selection Committee - Platinum Awardee for Mineral Processing Category
14-Nov-09	MGB - PMSEA 56th Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Awards (PMIEA) Selection Committee - Titatium Achievement Award under Mineral Processing Category
20-Nov-10	MGB - PMSEA 57th Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Awards (PMIEA) Selection Committee - Platinum Achievement Award under Mineral Processing Category
11-Nov-11	MGB - PMSEA 58th Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Awards (PMIEA) Selection Committee - Titanium Achievement Award under Mineral Processing Category
1-Apr-12	DENR IVB	Commendation for Implementation of various programs related to the National Greening Program
16-Nov-14	MGB - PMSEA 61st Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Award (PMIEA) - Mineral Processing Category
16-Nov-14	MGB - PMSEA 61st Annual National Mine Safety and Environment Conference (ANMSEC)	2014 Best Mining Forest Award - Mineral Processing Plant Category
1-Nov-15	MGB - PMSEA 62nd Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Award (PMIEA) - Mineral Processing Category
1-Nov-15	MGB - PMSEA 62nd Annual National Mine Safety and Environment Conference (ANMSEC)	2015 Best Mining Forest Award - Mineral Processing Plant Category
18-Nov-16	MGB - PMSEA 63rd Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Award (PMIEA) - Mineral Processing Category

20-Nov-16	MGB - PMSEA 63rd Annual National Mine Safety and Environment Conference (ANMSEC)	2016 Best Mining Forest Award - Mineral Processing Plant Category
1-Mar-17	MGB Regional Office IVB (MIMAROPA)	Certificate of Recognition - for the Outstanding Implementation of its Safety and Health, Environment and Social Development and Management Programs
19-Jun-17	Palawan Council for Sustainable Development	Environmental Champion Award
27-Sep-17	ASEAN Centre for Energy	Winner ASEAN Energy Awards for Clean Coal Use and Technology in the Power Generation- Industry- Small (<100MW/year) category
24-Nov-17	MGB - PMSEA 64th Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Award (PMIEA) - Mineral Processing Category
24-Nov-17	MGB - PMSEA 63rd Annual National Mine Safety and Environment Conference (ANMSEC)	2017 1st Runner-Up Mining Forest Award - Mineral Processing Plant Category
23-Nov-18	MGB - PMSEA 65th Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Award (PMIEA) - Mineral Processing Category
23-Nov-18	MGB - PMSEA 65th Annual National Mine Safety and Environment Conference (ANMSEC)	2018 Winner Mining Forest Award - Mineral Processing Plant Category
22-Nov-19	MGB - PMSEA 66th Annual National Mine Safety and Environment Conference (ANMSEC)	Presidential Mineral Industry Environmental Awards (PMIEA) Selection Committee - Platinum Achievement Award under Mineral Processing Category
22-Nov-19	MGB - PMSEA 66th Annual National Mine Safety and Environment Conference (ANMSEC)	2019 1st Runner-Up Mining Forest Award - Mineral Processing Plant Category
13-Dec-19	ASEAN Mineral Awards	Winner - Best Practices in Sustainable Mineral Development in Metallic Minerals Processing Category
18-Mar-21	MGB - PMSEA Annual National Mine Safety and Environment Conference (ANMSEC)	2020 Presidential Mineral Industry Environmental Awards (PMIEA) - Mineral Processing Category
18-Mar-21	MGB - PMSEA Annual National Mine Safety and	2020 Winner Mining Forest Award - Mineral Processing Plant Category

	Environment Conference (ANMSEC)	
26-Nov-21	MGB - PMSEA 67th Annual National Mine Safety and Environment Conference (ANMSEC)	2021 Presidential Mineral Industry Environmental Awards (PMIEA) - Mineral Processing Category
26-Nov-21	MGB - PMSEA 67th Annual National Mine Safety and Environment Conference (ANMSEC)	2021 Mining Forest Award (2nd Runner-Up) - Mineral Processing Plant Category
29-Jul-22	EMB Regional Office IVB (MIMAROPA)	Outstanding Stakeholder in the MIMAROPA Region: Implementation of ADOPT a Continuous Ambient Air Quality Monitoring Station Program
15-Sep-22	MGB Regional Office IVB (MIMAROPA)	Appreciation for the contribution to the successful conduct of nationwide simultaneous tree planting activity at the Palawan Quicksilver Mines, Inc. (PQMI) Rehabilitation Project Site in Brgy. Sta. Lourdes in PPC on September 13, 2022.
9-Nov-22	MGB Regional Office IVB (MIMAROPA)	Certificate of Recognition - for 15 million Man Hours without Lost-Time-Accident
18-Nov-22	MGB - PMSEA 68th Annual National Mine Safety and Environment Conference (ANMSEC)	2022 Presidential Mineral Industry Environmental Awards (PMIEA) - Mineral Processing Category
18-Nov-22	MGB - PMSEA 68th Annual National Mine Safety and Environment Conference (ANMSEC)	2022 Best Mining Forest Award - Mineral Processing Plant Category
17-Nov-23	MGB - PMSEA 69th Annual National Mine Safety and Environment Conference (ANMSEC)	2023 Presidential Mineral Industry Environmental Awards (PMIEA) - Mineral Processing Category
17-Nov-23	MGB - PMSEA 69th Annual National Mine Safety and Environment Conference (ANMSEC)	2023 Best Mining Forest Award - Mineral Processing Plant Category

Appendix C

Questionnaire

SURVEY QUESTIONNAIRE

I. Demographic Profile (Impormasyon ng Katugon)

Gender (Kasarian):
- ☐ Male (Lalaki)
- ☐ Female (Babae)

Gender (Kasarian):
- ☐ 18 taong gulang pababa
- ☐ 18-29 taong gulang
- ☐ 30-40 taong gulang
- ☐ 41-55 taong gulang
- ☐ 56 taong gulang pataas

Civil Status (Kalagayang Sibil):
- ☐ Single (Walang Asawa)
- ☐ Married (May Asawa)
- ☐ Widowed (Biyudo)
- ☐ Separated (Hiwalay sa Asawa)

Educational Attainment (Natapos):
- ☐ Wala
- ☐ Elementary (Elementarya)
- ☐ High School (Sekundarya)
- ☐ College (Kolehiyo)
- ☐ Vocational (Bokasyonal)

Religion (Relihiyon):
- ☐ Islam (Muslim)
- ☐ Christianity (Kristiyano)
- ☐ Others, specify. (Iba, tukuyin) _____

Tribe or Regional Grouping (Tribong Kinabibilangan):
- ☐ Indigenous People _____
- ☐ Tausug
- ☐ Others, specify. (Iba, tukuyin) _____

Occupation (Trabaho):
- ☐ Fisherman (Mangingisda)
- ☐ Farmer (Magsasaka)
- ☐ Government employee (Empleyado ng Gobyerno)
- ☐ Private employee (Pribadong empleyado)
- ☐ Student (Estudyante)
- ☐ NGO
- ☐ None or Housewife (Wala o Maybahay)
- ☐ Own business (May sariling Negosyo)

Income (Sahod):
- ☐ Php 5,000 pababa
- ☐ Php 6,000 to Php 10,000
- ☐ Php 10,001 to Php 15,000
- ☐ Php 15,001 at higit pa

Do you have a household member who works with RTNMC or RTNMC? (May kasama sa bahay na nagtatrabaho sa RTNMC o CBNC?):
- ☐ Php 5,000 pababa
- ☐ Php 6,000 to Php 10,000
- ☐ Php 10,001 to Php 15,000
- ☐ Php 15,001 at higit pa

How many years are you living in this area? (Ilang taon na kayong naninirahan sa lugar na ito?)
- ☐ Yes (Meron), If yes, what is the relationship.
- ☐ (Kung oo, tukuyin ang relasyon) _____
- ☐ None (Wala)

How far do you live from the mangrove area? (Gaano kalayo ang distansya ng tirahan Ninyo sa mga Bakawan?)
- ☐ 500 meters and below (500 metro pababa)
- ☐ 501 meters and above (Mahigit 500 metro)

II. Knowledge and perception on Mangroves (Kaalaman tungkol sa bakawan)

Where did you learn about mangroves. (Saan mo natutunan ang tungkol sa mga bakawan?)
- ☐ School (Paaralan)
- ☐ Mass Media (Midyang Panlahat) Halimbawa: radio, telebisyon
- ☐ Friends and Family (Kaibigan at Magulang)
- ☐ Others, specify. (Iba, tukuyin) _____

Do you agree that mangroves are essential to the economy and income of fishermen? (Sang-ayon ka ba na ang mga bakawan ay mahalaga sa mg akita ng mangingisda at ekonomiya ng bansa?)
- ☐ Yes (Oo)
- ☐ No (Hindi)
- ☐ Maybe (Siguro)

Do you agree that mangroves shield land from erosion, wind, and waves? (Sumasang-ayon ka ba na pinoprotektahan ng mga bakawan ang lupa mula sa pagguho, hangin, at alon?
- ☐ Yes (Oo)
- ☐ No (Hindi)
- ☐ Maybe (Siguro)

Do you agree that mangroves will face a serious threat if not conserved? (Sumasang-ayon ka ba na ang mga bakawan haharap sa isang seryosong banta kung gindi mapangalagaan?)
- ☐ Yes (Oo)
- ☐ No (Hindi)
- ☐ Maybe (Siguro)

III. Level of awareness of the community about the Adopt-A-Mangrove (AMA) Program (Antas ng kaalaman ng komunidad tungkol sa programang Adopt-A-Mangrove)

Have you heard about the Adopt-A-Mangrove Program of Coral Bay Nickel Corporation and do you support it? (Narinig mo na ba ang tungkol sa Adopt-A-Mangrove Program ng Coral Bay Nickel Corporation at sinusuportahan mo bai to?)
- ☐ Yes (Oo)
- ☐ No (Hindi)
- ☐ Maybe (Siguro)

Do you think the project will be successful? (Sa palagay mo ba ay magiging matagumpay ang proyekto?)
- ☐ Yes (Oo)
- ☐ No (Hindi)
- ☐ Maybe (Siguro)

Can the program standalone once have given to the community or People's organization after 5 years without the support of Coral Bay Nickel Corporation? (Maari bang maging sustainable ang proyekto kapag ito ay nabigay sa komunidad makalipas ang limang taon na walang suporta galing sa Coral Bay Nickel Corporation?)
- ☐ Yes (Oo)
- ☐ No (Hindi)
- ☐ Maybe (Siguro)

Appendix D

Memorandum of Agreement

MEMORANDUM OF AGREEMENT
FOR ADOPT-A-MANGROVE WITH NATIONAL GREENING PROGRAM (NGP) SITE

KNOW ALL MEN BY THESE PRESENTS:

This Memorandum of Agreement for Adopt-a-Mangrove with National Greening Program (NGP) Site ("MOA") is made and entered into this 27th day of June, 2023 by and between:

The **DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, REGION IV-MIMAROPA,** a National Government Agency of the Republic of the Philippines, with office and principal address at By the Bay Bldg., 1515 Roxas Blvd., Ermita, Manila represented by PENRO (Palawan) **FELIZARDO B. CAYATOC**;

and

The **CORAL BAY NICKEL CORPORATION (CBNC),** with office address at Barangay Rio Tuba, Bataraza, Palawan represented by its Plant Manager, **HIDEAKI SATO**

WITNESSETH:

WHEREAS, Executive Order (EO) No 192, mandates the Department of Environment and Natural Resources (DENR) as the primary government agency responsible for the sustainable management and development of the country's natural resources;

WHEREAS, the Forest Management Bureau (FMB) under the DENR allows the use of seedlings for tree replacement as planting materials for those National Greening Program (NGP)/Expanded National Greening Program (ENGP) sites with very low survival rate after the three-year maintenance and protection, and damage by fire, force majeure, and other causality;

WHEREAS, EO No. 26 was issued on February 2011 ordering and declaring the implementation of the National Greening Program (NGP) as government priority for poverty reduction, food security, biodiversity conservation and climate change mitigation and adoption;

WHEREAS, EO No. 26 prescribes the harmonization of all greening efforts similar initiatives of the government, private sector, Local Government Units (LGUs) and the civil society;

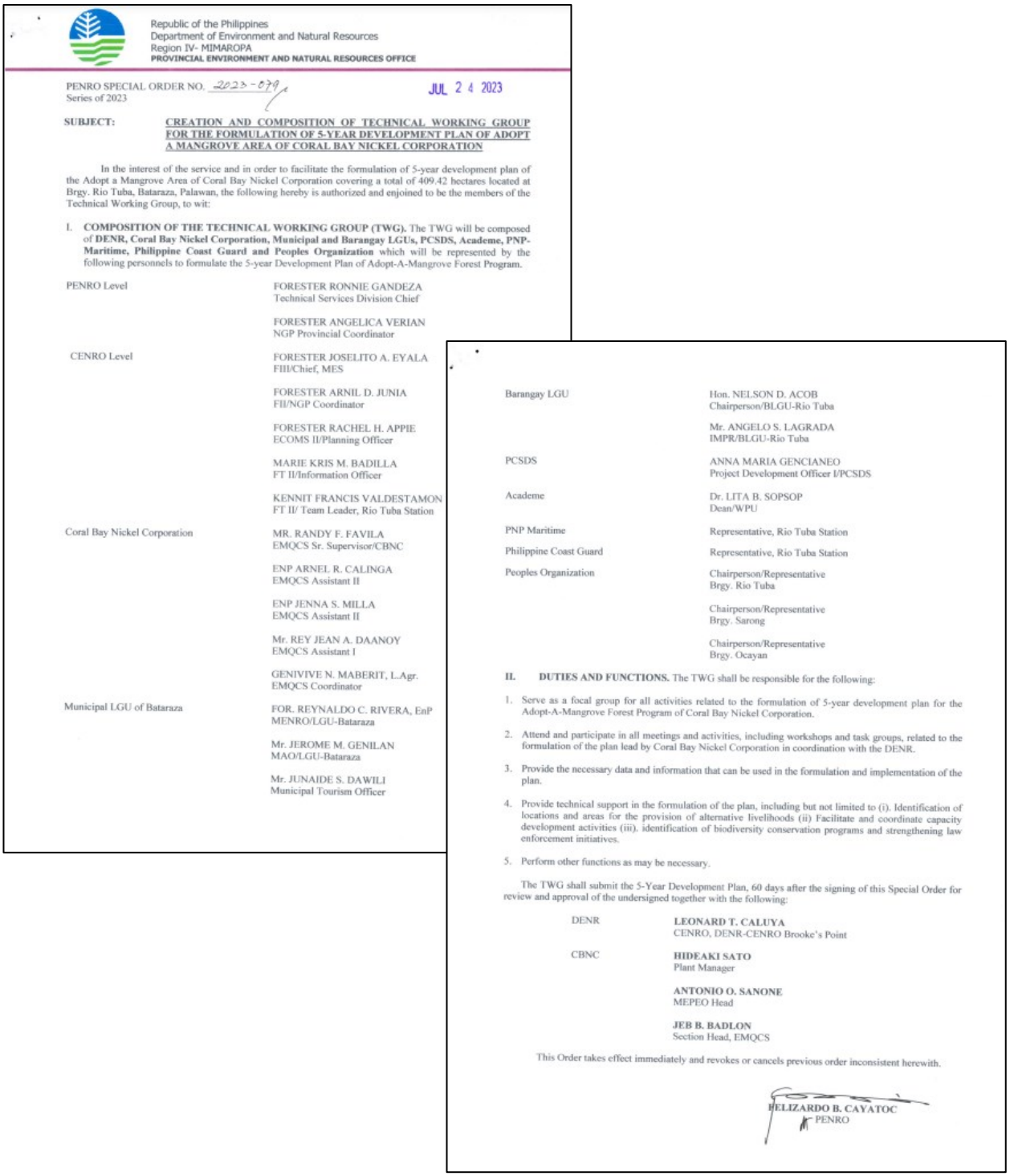
WHEREAS, the NGP includes, among others, the development and rehabilitation of forestlands (production and protection), and protected areas;

WHEREAS, DAO No. 2021-20, aims to offer untenured areas to qualified investors and provide appropriate tenure instruments or management arrangement;

WHEREAS, pursuant to EO No. 193 otherwise known as Expanding the Coverage of the National Greening Program (NGP), expanded the coverage of the NGP to comprise the remaining unproductive, denuded and degraded forest lands and the period of implementation is likewise extended from 2016 to 2028 and all sectors, particularly the private sector, are encouraged to actively participate in the ENGP.

Appendix E

PENRO Special Order No. 2023-079



Republic of the Philippines
Department of Environment and Natural Resources
Region IV- MIMAROPA
PROVINCIAL ENVIRONMENT AND NATURAL RESOURCES OFFICE

PENRO SPECIAL ORDER NO. 2023-079
Series of 2023

JUL 24 2023

SUBJECT: **CREATION AND COMPOSITION OF TECHNICAL WORKING GROUP FOR THE FORMULATION OF 5-YEAR DEVELOPMENT PLAN OF ADOPT A MANGROVE AREA OF CORAL BAY NICKEL CORPORATION**

In the interest of the service and in order to facilitate the formulation of 5-year development plan of the Adopt a Mangrove Area of Coral Bay Nickel Corporation covering a total of 409.42 hectares located at Brgy. Rio Tuba, Bataraza, Palawan, the following hereby is authorized and enjoined to be the members of the Technical Working Group, to wit:

I. **COMPOSITION OF THE TECHNICAL WORKING GROUP (TWG).** The TWG will be composed of **DENR, Coral Bay Nickel Corporation, Municipal and Barangay LGUs, PCSDS, Academe, PNP-Maritime, Philippine Coast Guard and Peoples Organization** which will be represented by the following personnels to formulate the 5-year Development Plan of Adopt-A-Mangrove Forest Program.

PENRO Level	FORESTER RONNIE GANDEZA Technical Services Division Chief
	FORESTER ANGELICA VERIAN NGP Provincial Coordinator
CENRO Level	FORESTER JOSELITO A. EYALA FIII/Chief, MES
	FORESTER ARNIL D. JUNIA FII/NGP Coordinator
	FORESTER RACHEL H. APPIE ECOMS II/Planning Officer
	MARIE KRIS M. BADILLA FT II/Information Officer
	KENNIT FRANCIS VALDESTAMON FT II/ Team Leader, Rio Tuba Station
Coral Bay Nickel Corporation	MR. RANDY F. FAVILA EMQCS Sr. Supervisor/CBNC
	ENP ARNEL R. CALINGA EMQCS Assistant II
	ENP JENNA S. MILLA EMQCS Assistant II
	Mr. REY JEAN A. DAANOY EMQCS Assistant I
	GENIVIVE N. MABERIT, L.Agr. EMQCS Coordinator
Municipal LGU of Bataraza	FOR. REYNALDO C. RIVERA, EnP MENRO/LGU-Bataraza
	Mr. JEROME M. GENILAN MAO/LGU-Bataraza
	Mr. JUNAIDE S. DAWILI Municipal Tourism Officer
Barangay LGU	Hon. NELSON D. ACOB Chairperson/BLGU-Rio Tuba
	Mr. ANGELO S. LAGRADA IMPR/BLGU-Rio Tuba
PCSDS	ANNA MARIA GENCIANEO Project Development Officer I/PCSDS
Academe	Dr. LITA B. SOPSOP Dean/WPU
PNP Maritime	Representative, Rio Tuba Station
Philippine Coast Guard	Representative, Rio Tuba Station
Peoples Organization	Chairperson/Representative Brgy. Rio Tuba
	Chairperson/Representative Brgy. Sarong
	Chairperson/Representative Brgy. Ocayan

II. **DUTIES AND FUNCTIONS.** The TWG shall be responsible for the following:

1. Serve as a focal group for all activities related to the formulation of 5-year development plan for the Adopt-A-Mangrove Forest Program of Coral Bay Nickel Corporation.
2. Attend and participate in all meetings and activities, including workshops and task groups, related to the formulation of the plan lead by Coral Bay Nickel Corporation in coordination with the DENR.
3. Provide the necessary data and information that can be used in the formulation and implementation of the plan.
4. Provide technical support in the formulation of the plan, including but not limited to (i). Identification of locations and areas for the provision of alternative livelihoods (ii) Facilitate and coordinate capacity development activities (iii). identification of biodiversity conservation programs and strengthening law enforcement initiatives.
5. Perform other functions as may be necessary.

The TWG shall submit the 5-Year Development Plan, 60 days after the signing of this Special Order for review and approval of the undersigned together with the following:

DENR	**LEONARD T. CALUYA** CENRO, DENR-CENRO Brooke's Point
CBNC	**HIDEAKI SATO** Plant Manager
	ANTONIO O. SANONE MEPEO Head
	JEB B. BADLON Section Head, EMQCS

This Order takes effect immediately and revokes or cancels previous order inconsistent herewith.

FELIZARDO B. CAYATOC
PENRO

Appendix F

Endorsement Letter to the Local Government Unit Bataraza

February 29, 2024

HON. ABRAHAM M. IBBA
Mayor
Municipal Government of Bataraza
Province of Palawan

Dear Hon Ibba:

Good day.

As part of the requirements for graduating Master of Environment and Natural Resources Management (ENRM) students of the University of the Philippines Open University, I am writing regarding the research topic "**ASSESSMENT OF MANGROVES IN THE COASTAL AREA OF SITIO BONGKOL-BONGKOL, BRGY. RIO TUBA, BATARAZA, PALAWAN**" proposed by **REYA MAGDALENA A. BELARO**.

In line with the aforementioned, Ms. Belaro is in need of relevant data, conduct interview and household survey relating to her research topic. All information or document provided by your office would be used for academic purposes.

In view thereof, the undersigned endorses the said research topic.

Thank you very much.

Very truly yours,

DR. CONSUELO DL. HABITO, Ph.D.
ENRM 290 Course Coordinator and Faculty-In-Charge
Master of Environment and Natural Resources Management
Faculty of Management and Development Studies
University of the Philippine Open University

Noted by:

DR. JOANE V. SERRANO, Ph.D.
Dean
Faculty of Management and Development Studies
University of the Philippine Open University

CC:
HON. ARMAN GAMO
Barangay Captain
Barangay Rio Tuba, Bataraza,
Palawan

Appendix G

Proposed Itinerary

REVISED ITINERARY (Proposed)

March 4 (Monday)

7:00 AM	Travel to Rio Tuba, Bataraza, Palawan via CJ4
8:30 AM	Arrival at Rio Tuba
9:00 AM	Preparation and review of related literatures; Gathering of relevant data/secondary data from CBNC (ICRMP/CRMP/Adopt—Mangrove Project/ National Greening Program/ Map of old boundaries of mangroves)
1:00 PM	*Safety Training at CBNC Plant Site (with Gaia South) – tentative*
2:00 PM	Finalization of Survey Questionnaires (in local dialect) and unstructured interview questions; Preparation of materials & log sheet

March 5-8 (Tuesday-Thursday)

8:00 AM	*Fieldwork with Gaia (Plotting & mangrove identification exact schedule to follow)*
	and/or
9:00 AM	Courtesy Call to LGU Bataraza
10:30 AM	Courtesy Call to Brgy. Rio Tuba

March 9-10 (Friday-Saturday)

8:00 AM	*Fieldwork with Gaia (Plotting & mangrove identification exact schedule to follow)*
	and/or
9:00 AM	Household perception survey at Sitio Bongkol-Bongkol
	Continuation of data gathering from LGU and conduct of interviews to MENRO, MPDO, Brgy. Rio Tuba, concerned personnel on demographics of RT (*except Saturday*)

March 10 (Sunday)

8:00 AM	Return to Manila via PPS (Land Trip if Kodiak is not available)

----- Forwarded by Reya Magdalena A Belaro/smmph on 03/01/2024 01:41 PM -----

From: Grace Erika M Nonog/CBNC/MNL/smmph
To: Reya Magdalena A Belaro/smmph@smmph, Alma M Villacorta/GAD/PAL/smmph@SMMPH, Arlene O Sumajit/GAD/PAL/smmph@SMMPH, Cristina D Bustamante/GAD/PAL/smmph@SMMPH
Cc: Benjamin Armand A Tansingco/smmph@SMMPH, Catherine Faye M Molinyawe/smmph@SMMPH, Maria Ledda E Imbang/smmph@SMMPH, Shaina S Abdulla/smmph@SMMPH, Hannah Jane V Jose/smmph@SMMPH
Date: 03/01/2024 01:32 PM
Subject: Re: Request Travel Arrangement March 4-10, 2024 CBNC -Gaia EIA Fieldwork Batch 2 (ECC Amendment)

Dear Ms. Reya,

Kindly see below arrangement for your BT:

Flight via CJ4
March 4 (Monday)
MNL-RT
ETD: 0600H

Commercial Flight
March 10 (Sunday)
PPS-MNL via PR 2786
ETD: 1525H

Appendix H

Copy of Gratuitous Permit

Republic of the Philippines
Republic Act 7611
PALAWAN COUNCIL FOR SUSTAINABLE DEVELOPMENT

WILDLIFE GRATUITOUS PERMIT(GP)
No.: 1709194196578

Grantee: **NEIL JAMES ESPINAS DURAN**
Consultant
GAIA South Inc., Environmental Consultants
Legaspi Village, Makati City, Philippines
njeduran@gaiasouthinc.com

Wildlife Gratuitous Permit for the Conduct of the Research Entitled Environmental Impact Assessment for the proposed expansion project of Coral Bay Nickel Corporation (CBNC)
Pursuant to the Provisions of PCSD Resolution No. 11-423 or PCSD Administrative Order No.12 *"Detailed Guidelines in the Implementation of Republic act 9147" and Joint DENR-DA-PCSD Administrative Order No. 01 as may be made applicable in the Province of Palawan"*, a Wildlife Gratuitous Permit(GP) for the utilization of ***Flora and Fauna (biota) Species for*** research purposes is hereby granted to:

NEIL JAMES ESPINAS DURAN

This permit is subject to the following terms and conditions

A.Data Gathering/Collection

1. The permittee shall gather/collect data only in Barangays Rio Tuba and Ocayan, Bataraza, Palawan
2. The Permittee shall only collect the following samples for research purposes:

Local/Common Name	Scientific Name	Description	Quantity
Soil Samples	*N/A*	Soil Samples	10kg
Freshwater Biota Samples	*to be provided*	Water Samples	5liter

3. The permittee must ensure that data collection methods shall not harm associated wildlife species and the environment within the study sites;
4. All collected samples shall be used strictly for scientific purposes as indicated in the research proposal submitted and shall not in any manner be used for commercial purposes or for extraction of genetic material, such as pharmacological screening, toxicological tests or similar activities. Any bio-prospecting activity is not covered by this permit and shall adhere to the Joint DENR-PCSD-DA Administrative Order No. 1 whenever applicable and necessary;
5. The permittee must submit to the PCSDS the list of all specimens collected which must indicate the following: a. Scientific, common and local names; and b. Specific areas of collection with geographical coordinates
6. The permittee must observe the standard/globally accepted and recognized scientific protocol for handling of wildlife species;
7. The permittee must secure a Local Transport Permit (LTP) from the PCSD prior to transport of collected specimens outside Palawan.

B. General

8. The permittee shall allow PCSD complete access to data/information generated from the study. Provided, that data/information to be regarded as confidential as mutually determined by PCSD and the permittee shall not be divulged to any third party unless agreed upon by both parties;
9. The permittee shall submit to PCSD, not later than 90 days after expiration of this permit, the following: Copies of field/raw data and the subsequent final reports; and Copies of all published reports generated and which this study was cited.
10. The permittee shall formulate and submit to the PCSD, not later than 90 days after expiration of this permit, appropriate policy recommendation/s related to the output of the research;
11. The permittee shall present the results of the study to a forum organized by the PCSD, provided that all travel expenses shall be shouldered by the permittee (if necessary);
12. The permittee must properly acknowledge in publication/s the participation of the following entities: LGUs concerned, PCSDS if present, and Other entities/agencies involved
13. The permittee shall ensure that members of research/survey team/s under this permit shall coordinate with the concerned LGUs and/or IP community regarding data collection for research activities that will be conducted in the study areas;

14. The permittee shall assume full responsibility and liability for damages to private/public property caused by the research;
15. Any alteration, erasure, or obliteration in this permit shall be sufficient ground for the cancellation/revocation of this permit without prejudice to criminal and other liabilities of the offender;
16. In case there is a need for additional condition/s to ensure environmental integrity and public safety as a result of regular monitoring/inspection, the same shall be imposed by PCSD/S;
17. The permittee shall comply with other provisions of RA 9147 and PCSD Administrative Order No. 12, as amended, which may be applicable but are not explicitly specified in this Permit;
18. This Permit is NON-TRANSFERABLE and shall be valid only until March 31, 2025;
19. After the validity period, application for renewal may be submitted if necessary.
20. Upon expiration of this Gratuitous Permit, the permittee shall have no authority to possess all voucher/preserved specimens collected. Thus, the permittee must deposit all specimens collected by virtue of this GP to either of the following: a. Philippine National Museum b. UPLB Museum of Natural History c. PCSD/S d. PSU Herbarium, Puerto Princesa City

Atty. Teodoro Jose S. Matta
Executive Director

CONFORME

I **NEIL JAMES ESPINAS DURAN** , holder of the foregoing permit, hereby certify that I have read and understood the Terms and Conditions for which this permit was issued and I hereby express my conformity thereto and my commitment to abide by the provisions of PCSD AO 12, as amended.

DATE ISSUED : MARCH 8, 2024
EXPIRY DATE : MARCH 7, 2025

PAID UNDER O.R. NO : 2423895
AMOUNT PAID : 160
DATE OF PAYMENT :

Approved by:
LEVITA A. LAGRADA, MSC
Director II, Office of the Executive Director/ In-charge for Operations, PCSDS

Print No.: 1709858612071 , Document Number: 1709194196578