MEMORANDUM

FOR : **THE DIRECTORS**
Environmental Management Bureau
Mines and Geosciences Bureau
Forest Management Bureau
Biodiversity Management Bureau
Ecosystems Research and Development Bureau
Land Management Bureau

THE ADMINISTRATOR
National Mapping and Resource Information Authority

THE EXECUTIVE DIRECTOR
National Water Resources Board

FROM : **THE DIRECTOR**
Climate Change Service

SUBJECT : **REQUEST FOR ASSESSMENTS AND REFERENCES RELATED TO THE STAGES OF THE GREEN ASSESSMENT FRAMEWORK**

DATE : 19 December 2022

This refers to the current efforts to harmonize the Green Assessment Framework (GAF) within the department. This is being done to stocktake existing assessments under different offices. The GAF is also an identified tool that can possibly be used by the DENR to ensure active involvement in NDRRMC as one of its member-agencies, particularly during the Rapid Damage Assessment and Needs Analysis (RDANA) or the Post Disaster Needs Assessments (PDNA) process, to ensure that damages to ecosystems by disasters are taken into account.

The Green Assessment Framework is divided into four (4) stages, namely the 1) Rapid Appraisal, 2) Ground Validation Surveys, 3) Analysis and Interpretation, and 4) Green Resilience Planning. Attached are documents for your reference.

With this, may we request your office to submit a list of assessments that may be related to the Green Assessment and relevant references, if any until **Thursday, December 29, 2022**. The inputs will create a clearer view to prevent duplication of work and strategically adopt the assessment as a post-disaster tool for the department.

Should you have queries and concerns, CCS key staff Raquel Ortega (rscortega@denr.gov.ph) and JM Reboton (jmnreboton@denr.gov.ph) can be contacted through 02-8928-1194.

Thank you for your usual support and cooperation.

ELENIDA DEL ROSARIO BASUG

MEMO NO. 2022 - 892

Green Assessment Framework

BACKGROUND

- In January 2022, the USAID SIBOL[1] launched the green assessment in Palawan in response to the devastation brought by typhoon Odette in December 2021. The results of the assessment will be used as a basis to develop reconstruction and rehabilitation of green ecosystems to ensure recovery and reduce risks from similar disasters in the future.

- The framework consists of four stages. **Stage 1** is conducting rapid appraisals by identifying any changes in forest surface cover and ecosystem assets. **Stage 2** employs both centralized streams of data gathering on defined damage hotspots in order to widen the coverage of data capture. **Stage 3** will analyze and visualize the information gathered from Stages 1 and 2 to enable assessment of the extent of damage and changes in land use. Finally, **Stage 4** aims, with the cooperation of key stakeholders, to formulate management recommendations and plans for restoration and rehabilitation, and resilience planning.

- On March 15, 2022, an initial meeting was held with Undersecretary Analiza Rebuelta-Teh and Dir Elenida Basug of Climate Change Service (CCS) with representatives from USAID SIBOL to discuss the green assessment and its role in post disaster assessment. The DENR recognized its use in the environmental sector as a tool for ecosystem assessment not only for reconstruction but also for planning future activities/measures.

- Upon consultation with the then Secretary and Task Force Build Back Better (TFBBB) Chairperson, Roy A. Cimatu, it was recommended to explore the possibility to adopt the framework to DENR regular programs. The CCS as secretariat to the Task Force Build Back Better was instructed to coordinate with USAID SIBOL.

- In June 2022, CCS, Forest Management Bureau, Biodiversity Management Bureau, Mines and Geosciences Bureau, DENR Regions 6, 7, 8, 10, and 13 were invited to join training and assessments to be oriented on the Framework. Representatives from the Regional Offices mentioned were able to attend.

- On August 10, 2022, with the appointment of Secretary Maria-Antonia Yulo-Loyzaga, the CCS included in its briefing the adoption for the green assessment framework. The Secretary instructed the service to continue exploring options for its adoption. After the meeting, coordination through

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[1] Philippine Sustainable Interventions for Biodiversity, Oceans and Landscapes (SIBOL) is a 5-year project launched by the United States Agency for International Development (USAID) that will support the management of the country's natural resources and combat environmental crimes. The Research Triangle Institute International serves as its lead implementer.

emails and meetings were done to identify points for collaboration under the green assessment and other projects.

CAPACITY BUILDING
- On September 07, 2022, a meeting with CCS and USAID SIBOL representatives was conducted to finalize green assessment related assistance. It was agreed that USAID SIBOL can provide the resources for capacity building to conduct the green assessment for DENR.

- On October 17-21, 2022, Stage 1: Rapid Appraisal Training for the Visayas-Mindanao Cluster was conducted in Cebu City. On November 14-18, 2022, the training for the Luzon Cluster will be held in Clark, Pampanga.

NEXT STEPS
Internal discussions with concerned Offices on:

- Adoption and mainstreaming of the green assessment framework in the Department
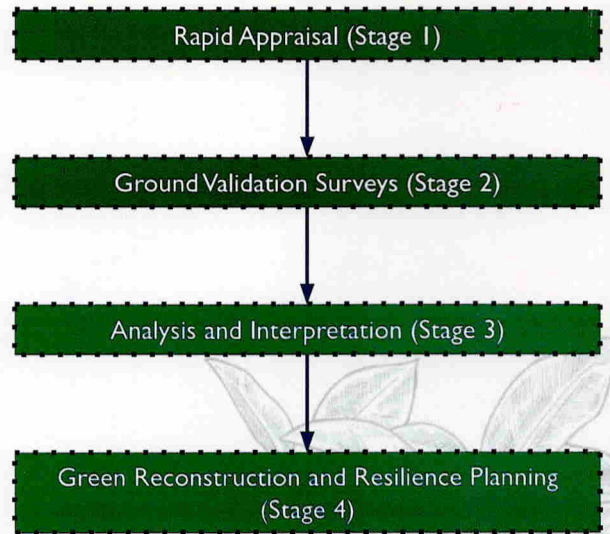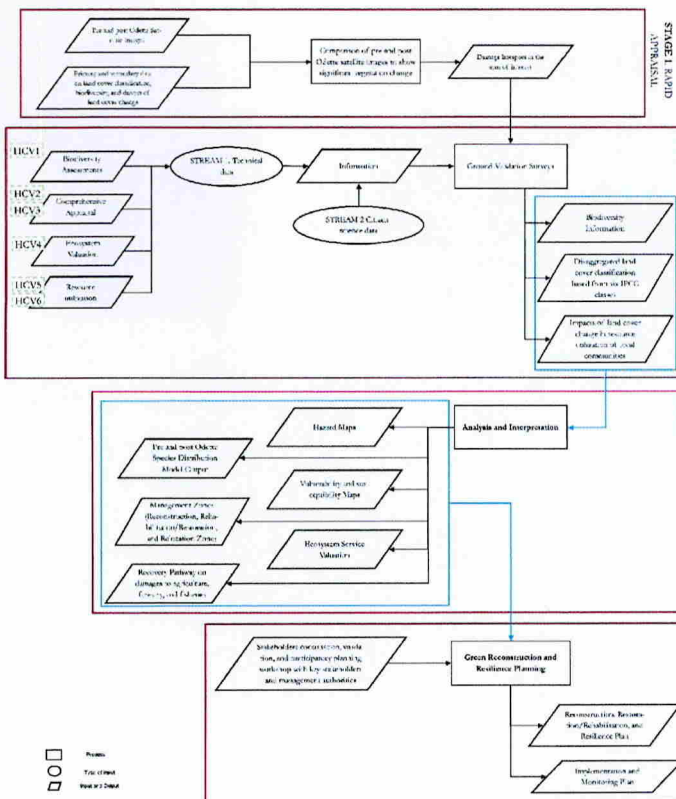- Harmonization of schedule of activities (meetings, workshops/trainings, pilot testings, etc.)

Sustainable Interventions for Biodiversity, Oceans and Landscapes Project

GREEN ASSESSMENT FRAMEWORK

March 01, 2022

Rapid Appraisal (Stage 1)

Ground Validation Surveys (Stage 2)

Analysis and Interpretation (Stage 3)

Green Reconstruction and Resilience Planning (Stage 4)

Green Assessment towards a Green Recovery/Reconstruction and Resilience:
Stage 1. Rapid Appraisal

Pre and Post Odette Satellite Images

Primary and Secondary Data on land cover classification, biodiversity, and drivers of land cover change

Comparison of Pre and Post Odette satellite images to show significant vegetation change

Damaged hotspots in the area of interest

Ground Validation Surveys (Stage 2)
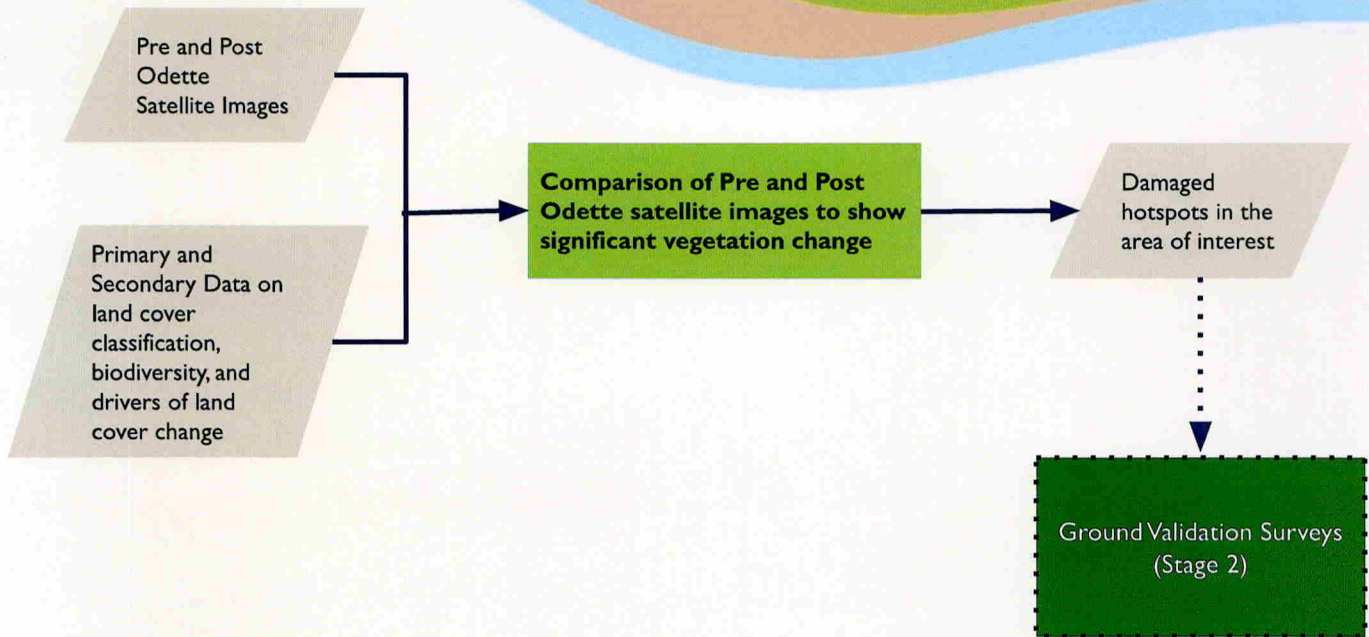
Green Assessment towards a Green Recovery/Reconstruction and Resilience:
Stage 2. Ground Validation Surveys to assess impacts to HCVs

Rapid Appraisal (Stage 1)

Biodiversity Assessments

HCV 1

HCV 2

Comprehensive Appraisal

HCV 3

Ecosystem Valuation

HCV 4

Resource Utilization

HCV 5

HCV 6

STREAM I. Technical Data

STREAM II. Citizen Science Data

Information

Ground Validation Surveys

Biodiversity Information

Disaggregated land cover classification based from 6 IPCC classes

Impacts of land cover change in resource utilization of local communities

Analysis and Interpretation (Stage 3)

Green Assessment towards a Green Recovery/Reconstruction and Resilience:
Stage 3. Data Analysis and Interpretation

Analysis and Interpretation

Hazard Maps

Vulnerability and Susceptibility Maps

Ecosystem Service Valuation

Management Zones (Reconstruction, Rehabilitation/ Restoration, & Relocation Zones)

Pre and Post Odette Species Distribution Model Output

Recovery Pathway on damages to agriculture, forestry, & fisheries

Green Reconstruction and Resilience Planning (Stage 4)
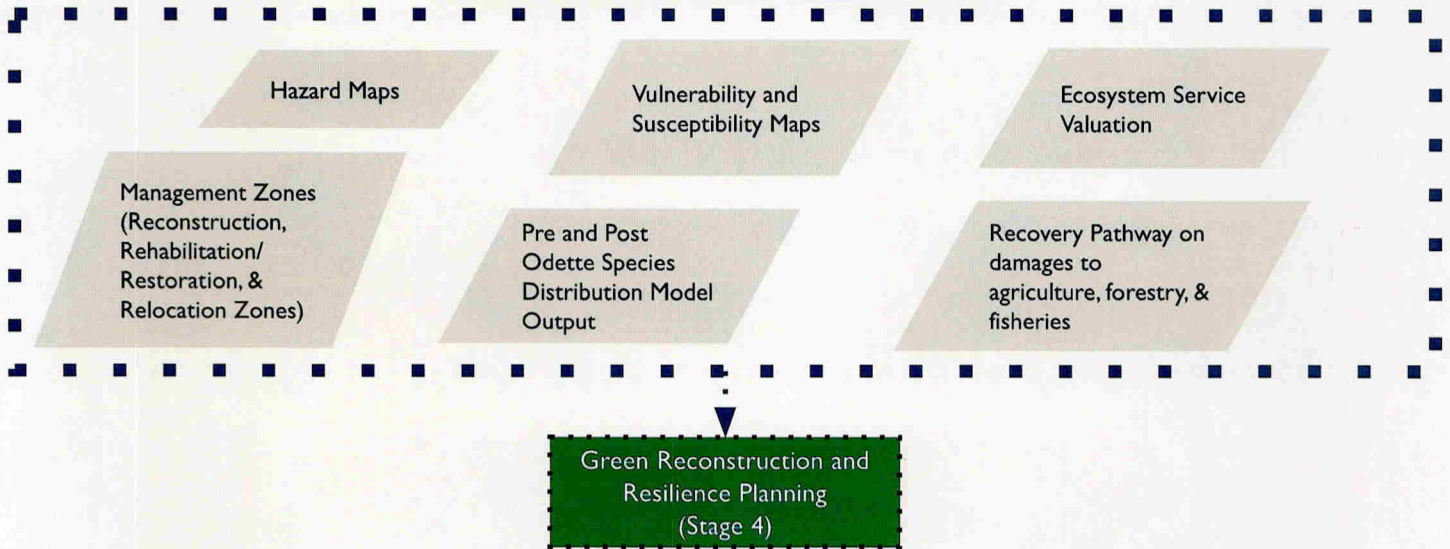
Green Assessment towards a Green Recovery/Reconstruction and Resilience:
Stage 4. Green Reconstruction & Resilience Planning

Stakeholders consultation, validation, and participatory planning workshop with key stakeholders and management authorities

Green Reconstruction and Resilience Planning

Reconstruction, Restoration/Rehabilitation, and Resilience Plan

Implementation and Monitoring Plan
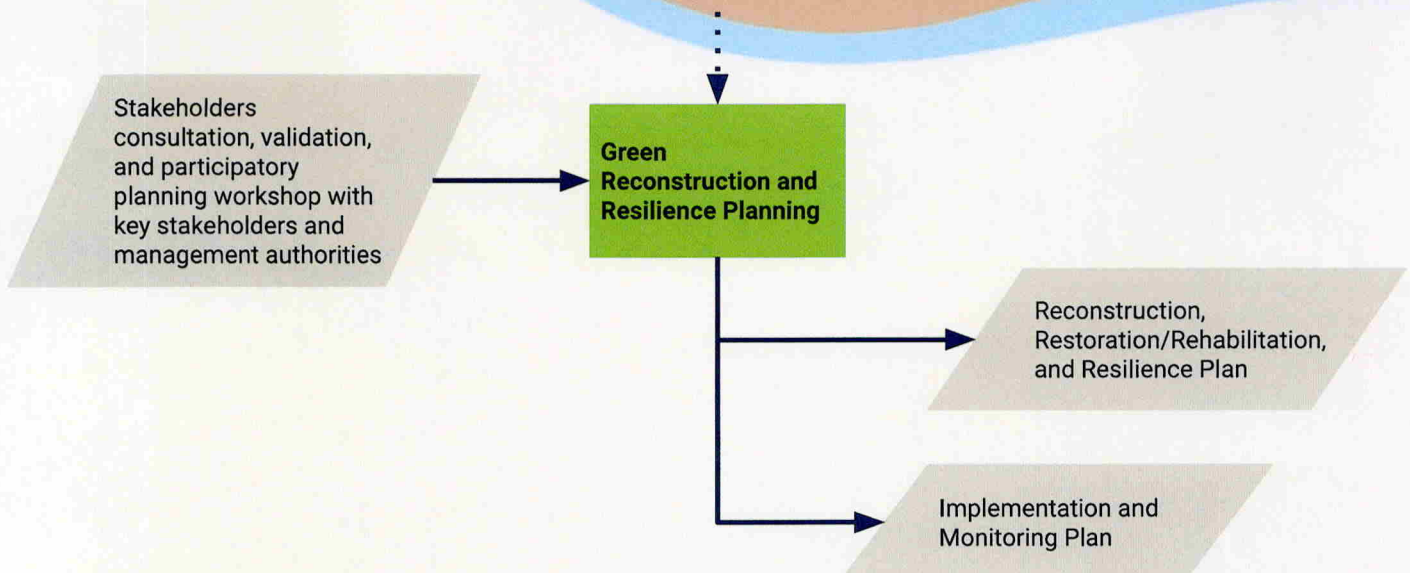
Expected Outputs

- Map
  - Hazard maps
  - Vulnerability/susceptibility maps
  - Community resource map on damage hotspots
  - Pre and post Odette species distribution models to see changes and impacts on species, and ecosystem/habitat refugia
  - Management zones map (e.g.reconstruction and restoration/rehabilitation zone; and relocation zones)

- Pre and Post Odette ecosystem service valuation

- Skills upgrade of local community partners and stakeholders in the use of technology-based techniques for data capture and monitoring

- Comprehensive plans for restoration, green reconstruction, rehabilitation, and resilience

Areas Covered by the Green Assessment

Cleopatra's Needle KBA

Puerto Princesa City
1. Binduyan*
2. Concepcion*
3. Langogan*
4. New Panggangan*
5. San Rafael*
6. Tagabinet*
7. Tanabag*
8. Babuyan
9. Buenavista
10. Lucbuan
11. Macarascas
12. Manalo
13. Maoyon
14. Maruyugon
15. Salvacion

San Vicente
1. Caruray
2. Port Barton

Roxas
1. Caramay
2. Jolo
3. Magara
4. Salvacion
5. San Miguel
6. Tinitian

PPSRNP

Puerto Princesa City
1. Cabayugan
2. Marufinas
3. New Panggangan
4. Tagabinet

Outside SIBOL (Puerto Princesa City)
1. Bagong Bayan
2. Bahile
3. Napsan
4. Simpocan

*Sites within CNCH (Cleopatra's Needle Critical Habitat)

ACTIVITIES	January				February				March				April				May				June			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop data model			▓	▓	▓	▓	▓																	
Stage 1: Collection of satellite images in impacted areas			▓	▓	▓	▓	▓																	
Stage 2: Ground validation surveys to assess impacts on HCV																								
Activity 1. Comprehensive Appraisal																								
- Stream 1. Aerial Ground Truthing **MARCH 21 start of survey**										▓	▓	▓	▓	▓	▓	▓								
- Stream 2. Capacity building and stakeholder participation **March 7 to 8 Virtual training on remote sensing** **March 14 to 18 Aerial Ground Truth Training**									▓	▓														

Timeline - ACTIVITY 1

Remote Sensing Training (OJT) Mode: Virtual Qualifications: Background on GIS	Aerial Ground truthing Training Mode: Face to Face Qualifications: Experience on drone sampling	Ground Truth Surveys (Comprehensive Appraisal) Mode: Face to Face, Field Conditions Qualifications: Experience on drone sampling
1. PCSDS Central office - 3pax 2. PCSDS North district office - 3pax 3. DENR PENRO - 2pax 4. DENR CENRO PPC - 1pax 5. DENR CENRO Roxas - 1 pax 6. City ENRO (PPC) - 2 pax 7. MENRO (Roxas) - 1 pax 8. MENRO (San Vicente) - 1 pax	1. PCSDS Central office - 3pax 2. PCSDS North district office - 3pax 3. DENR PENRO - 2pax 4. DENR CENRO PPC - 1pax 5. DENR CENRO Roxas - 2 pax 6. City ENRO (PPC) - 2 pax 7. MENRO (Roxas) - 2 pax 8. MENRO (San Vicente) - 1 pax	1. PCSDS Central office - 3pax 2. PCSDS North district office - 3pax 3. DENR PENRO - 2pax 4. DENR CENRO PPC - 1pax 5. DENR CENRO Roxas - 1 pax 6. City Planning - 1 pax 7. City DRR - 1 pax 8. MENRO (Roxas) - 2 pax 9. MENRO (San Vicente) - 1 pax 10. Local experts/guides - 6pax (participants will join the fieldwork in their respective municipality: 2pax from each municipality), this is part of the Cash for Work program

Note:
- Participants joining the ground truth surveys **must attend** the aerial ground truth training.
- Participants for the remote sensing training can be different from those joining the aerial ground truth training.
- Five drone teams will be formed.

Drone Team Composition:

- 2 Drones from SIBOL
- 1 Drone from PCSD
- 1 Drone from PCSDS DMD North
- 2 Drones from PENRO (1 sure drone)
- 1 Drone from City Planning

= 5 drone teams

ACTIVITIES	March				April				May				June			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Activity 2. Biodiversity Assessment																
- Stream 1. Rapid biodiversity Assessment Indicative timeline (will depend on the conditions at the field): • March 9 - Calibration and Planning • March 11 to March 22 - Puerto Princesa Subterranean River National Park • March 28 to April 8 - Cleopatra's Needle (will include Puerto Princesa City, San Vicente and Roxas, details about the jump off points/barangays TBD) • April 18 to 29 - Bacungan-Napsan area		▓	▓	▓	▓	▓	▓	▓	▓							

Timeline - ACTIVITY 2

Participants

- Field conditions
- Will stay in the field for 10 to 12 days straight

Puerto Princesa Subterranean River National Park (two campsites)
- 16 parataxonomists (local experts, community members, will be trained on collecting biodiversity data)
- 14 protected area staff, including forest rangers
- 1 cook
- 70 porters (per trip only, will not join for the duration of the activity)

Cleopatra's Needle (two campsites: 1 in CNCH, 1 in Roxas or San Vicente)
- 16 parataxonomists (local experts, community members, will be trained on collecting biodiversity data)
- For CNCH area: CNCH staff
- For Roxas or San Vicent area: MENRO staff
- 1 cook
- 70 porters (per trip only, will not join for the duration of the activity)

Bacungan-Napsan area (one campsite)
- 16 parataxonomists (local experts, community members, will be trained on collecting biodiversity data)
- City ENRO staff
- 1 cook
- 35 porters (per trip only, will not join for the duration of the activity)

ACTIVITIES		March				April				May				June			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	
Activity 2. Biodiversity Assessment																	
- Stream 2. Citizen Science Information Gathering Timeline for the training: March 22 to April 7, 2022 - Puerto Princesa City Batch April 19 to 21, 2022 - San Vicente Batch April 25 to May 25, 2022 - Roxas Batch June 2022 - start of monthly monitoring for the Cash for Work Program																	

Timeline - ACTIVITY 2 (Citizen Science)

Citizen Science Information Gathering

Technology Solutions

Boots on the Ground

Remote Data Capture
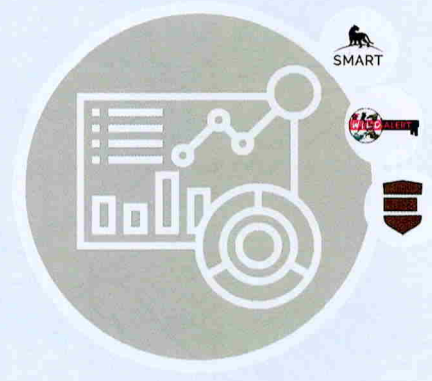
Data Management and Visualization

SMART

Monitoring Process

Sabang

SITIO SABANG

Cabayugan

Cleopatra Needle, 1593m
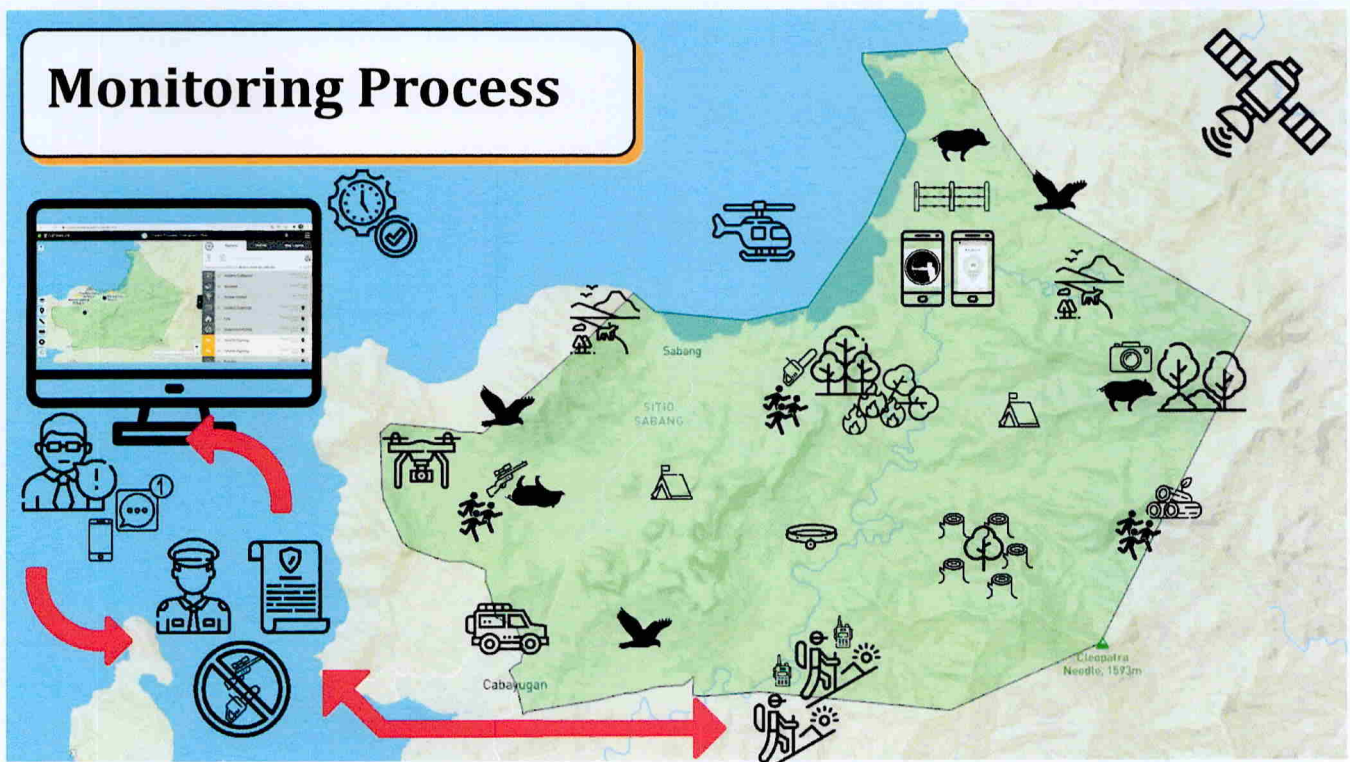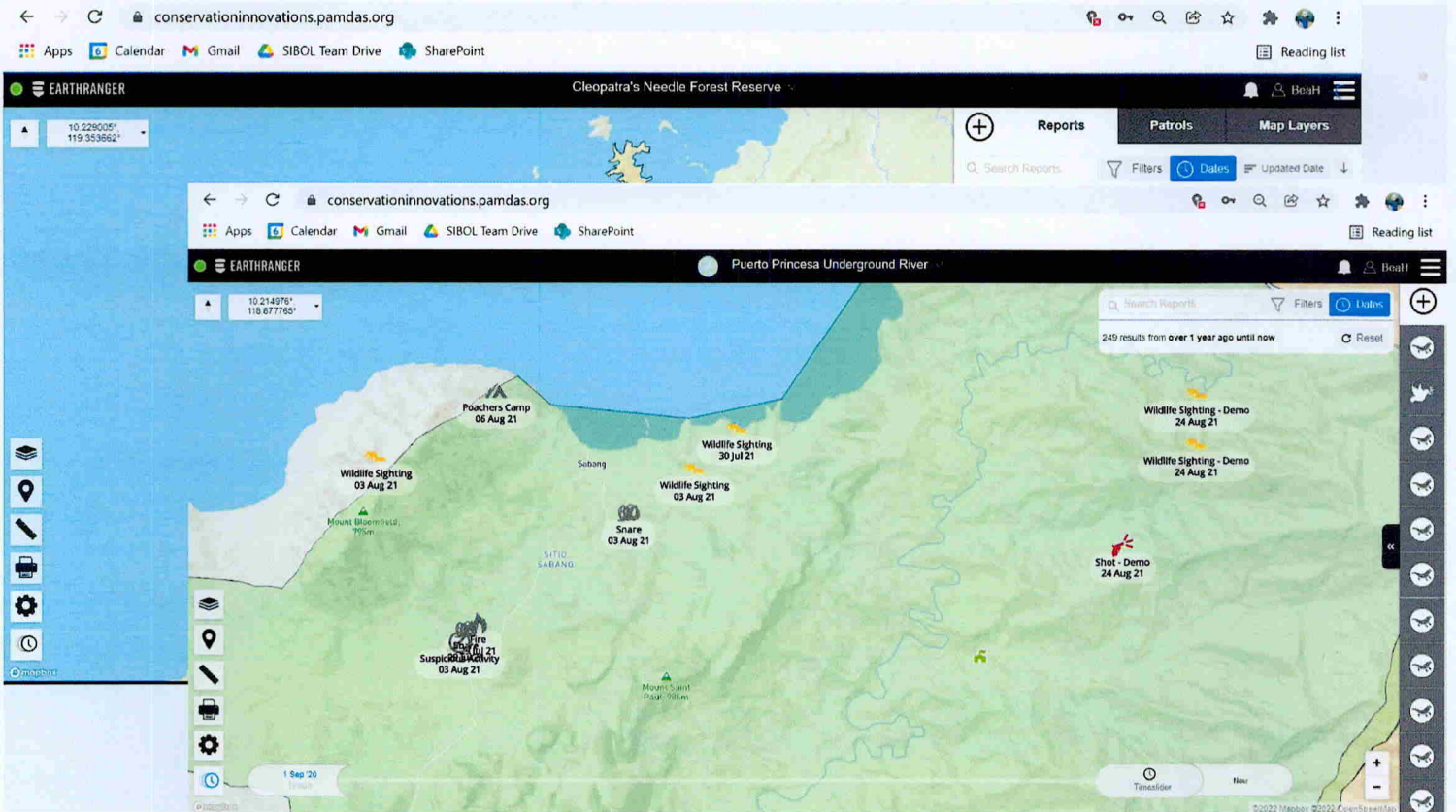
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Activity 3. Study of land-use change																								
- Stream 1. Ground Validation on Drivers of Change **March 11 to April 11 - Ground validation surveys** **April 20 to 23 - Focus Group Discussions**							▓	▓	▓	▓	▓	▓												
- Stream 2. Citizen Science Information Gathering								▓	▓	▓	▓	▓												

Participants - 2 local guides per barangay to be visited

Preliminary results:
Vegetation change pre-Odette and post-Odette

Processes involved;
- Stage 1, rapid mapping to quickly determine where apparent changes, in terms of vegetation loss or damage, have occurred;
- Live green vegetation we detect through remote sensing; and
- Calculated as vegetation index values (NIR-Red)/(NIR+Red).

Assumptions:
- Live vegetation has moderate to high NDVI values (0.74 to 0.34);
- Damaged vegetation, vegetation loss or barren land (< 0.34); and
- NDVI values inferred from published literature and locally observed values.

Preliminary results:
Vegetation change pre-Odette and post-Odette
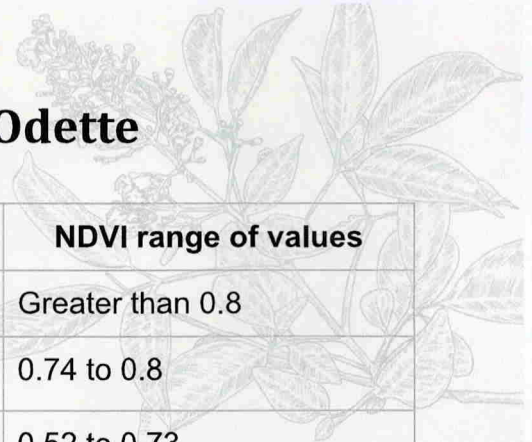
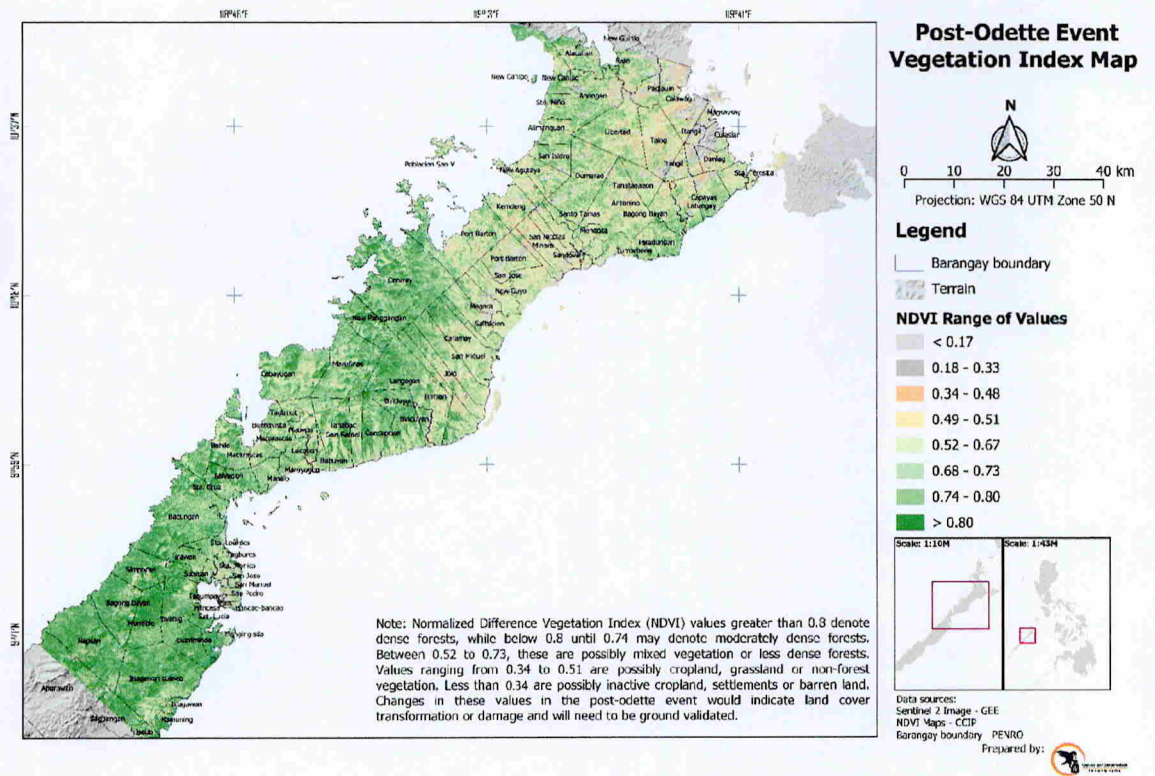| Possible land cover categories*	NDVI range of values
Dense forests	Greater than 0.8
Moderately dense forests	0.74 to 0.8
Mixed vegetation or less dense forests	0.52 to 0.73
Cropland, grassland or non-forest vegetation	0.34 to 0.51
Inactive cropland, settlement infrastructure or barren land	Les than 0.34

*will be further ground validated and reclassed in stage 2 process

pre-Odette

Pre-Odette Event Vegetation Index Map

N

0 10 20 30 40 km

Projection: WGS 84 UTM Zone 50 N

Legend

☐ Barangay boundary
Terrain

NDVI Range of Values

< 0.17
0.18 - 0.33
0.34 - 0.48
0.49 - 0.51
0.52 - 0.67
0.68 - 0.73
0.74 - 0.80
> 0.80

Scale: 1:10M   Scale: 1:43M

Note: Normalized Difference Vegetation Index (NDVI) values greater than 0.8 denote dense forests, while below 0.8 until 0.74 may denote moderately dense forests. Between 0.52 to 0.73, these are possibly mixed vegetation or less dense forests. Values ranging from 0.34 to 0.51 are possibly cropland, grassland or non-forest vegetation. Less than 0.34 are possibly inactive cropland, settlements or barren land. Changes in these values in the post-odette event would indicate land cover transformation or damage and will need to be ground validated.

Data sources:
Sentinel 2 Image - GEE
NDVI Maps - CCIP
Barangay boundary PEVRO

Prepared by:

post-Odette

Post-Odette Event Vegetation Index Map

N

0 10 20 30 40 km

Projection: WGS 84 UTM Zone 50 N

Legend

☐ Barangay boundary
Terrain

NDVI Range of Values

< 0.17
0.18 - 0.33
0.34 - 0.48
0.49 - 0.51
0.52 - 0.67
0.68 - 0.73
0.74 - 0.80
> 0.80

Scale: 1:10M   Scale: 1:43M

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Data sources:
Sentinel 2 Image - GEE
NDVI Maps - CCIP
Barangay boundary PEVRO

Prepared by:

...where changes occurred from pre- to post-Odette

Pre- and Post-Odette Event Normalized Difference Vegetation Index (NDVI) Comparison Map

N

0   10   20   30 km

Projection: WGS 84 UTM Zone 50 N

Legend

☐ Barangay boundary

░ Terrain

NDVI

☐ Possible vegetation growth

▨ Possible vegetation loss/damage

Scale: 1:10M   Scale: 1:43M

Data sources:
Sentinel 2 Image - GEE
NDVI Maps - CCIP
Barangay boundary - PENRO

Prepared by:
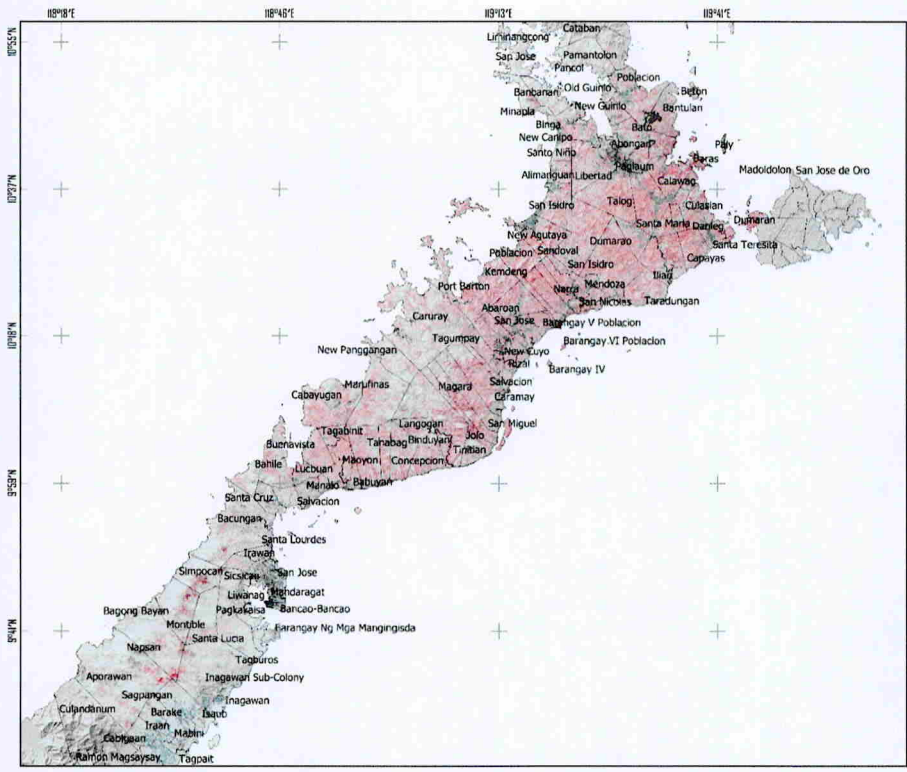
...additional mapping, but on PCSD's "to dos"

☐ AOI PCSD

☐ Proposed AOI for PCSD

☐ CCIP AOI

▨ Additonal extent

Sustainable Interventions for Biodiversity, Oceans and Landscapes
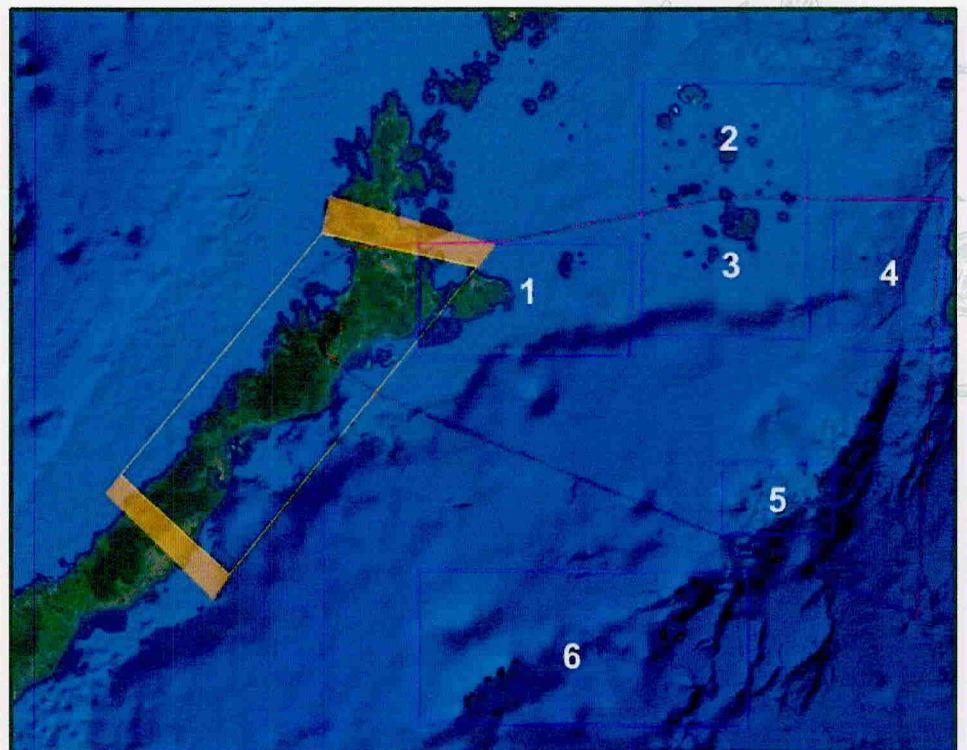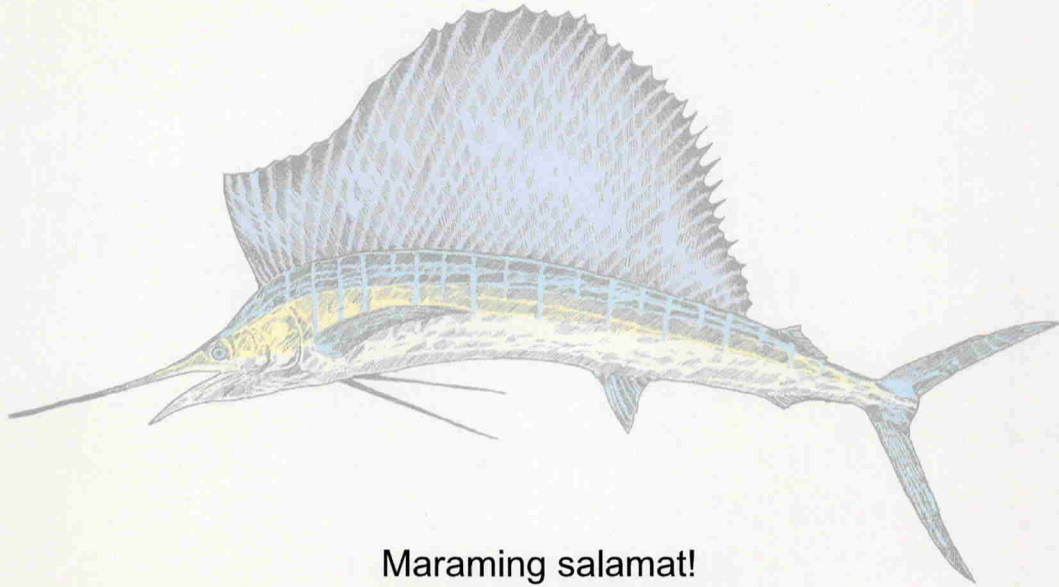
Maraming salamat!

Sustainable Interventions for Biodiversity, Oceans and Landscapes Project