

Republic of the Philippines
Department of Environment and Natural Resources
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MEMORANDUM

TO : **THE BUREAU DIRECTORS**
Forest Management Bureau
Biodiversity Management Bureau
Mines and Geosciences Bureau
Ecosystems Research and Development Bureau

THE ADMINISTRATOR
National Mapping and Resource Information Authority

THE SERVICE DIRECTORS
Policy and Planning Service
Knowledge and Information Systems Service
Climate Change Service

THE REGIONAL EXECUTIVE DIRECTORS
All Regions

FROM : **THE UNDERSECRETARY**
Finance, Information Systems and Climate Change

SUBJECT : **REQUEST FOR PARTICIPANTS TO THE CAPACITY
DEVELOPMENT ON AERIAL GROUND TRUTHING - SECOND
STEP OF THE GREEN ASSESSMENT FRAMEWORK**

DATE : **10 JULY 2023**

In relation to the Memorandum dated 26 May 2023 on the Application of the Green Assessment Framework - Rapid Appraisal and Ground Truthing Survey, the Climate Change Service in collaboration with USAID SIBOL¹ will be conducting the capacity development on aerial ground truthing, second step of the green assessment.

Initially formulated to post-disaster scenarios by the USAID SIBOL project, specifically for Typhoon Odette, the green assessment will be adopted by the Department to provide pre- and post-disaster studies based on ecosystems and biodiversity that will serve as the foundation

¹ Philippine Sustainable Interventions for Biodiversity, Oceans and Landscapes (SIBOL) is a 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.

for planning for future disaster risks as well as green reconstruction and resilience planning. This Framework has three tiers: Stage 1, which involves Rapid Appraisal to determine the extent of damage to ecosystems, Stage 2, which entails post-disaster comprehensive assessment of biodiversity, ecosystems, and ecosystem services and Stage 3 Resilience Planning.

The series of workshops will aim to enhance the capacity of DENR employees through the updating of existing methodologies and adoption of new ones for the department.


The Aerial Ground Truthing will validate data from the rapid appraisal step through the use of remotely piloted aircraft systems (RPAS) and hands-on drone piloting. Collected data will be organized and will be processed for refinement.

With this, may we request three (3) representatives from Regional/Provincial/Community levels of the department and three (3) representatives from Bureaus and Attached Agencies to be trained for aerial ground truthing to be conducted on **July 31-August 4 (Luzon Cluster) and August 7-11, 2023 (Visayas-Mindanao Cluster)** in a venue within Region 3 and 7. We strongly encourage the attendance of field personnel from our PENROs and CENROs.

USAID SIBOL will be covering the food and accommodation expenses during the workshop proper. Travel expenses of chosen representatives from and to their place of assignments must be charged to each respective office.

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. Please fill-up the registration form (<https://tinyurl.com/GAS2AGT-Registration>) to confirm the attendance of your participants on or before **July 24, 2023**.

Please see attached concept note and draft special order for more detailed information on the activity.


ATTY. ANALIZA REBUELTA-TEH

CC: Undersecretary for Organizational Transformation and Human Resources
Undersecretary for Field Operations - Luzon, Visayas and Environment
Undersecretary for Field Operations - Mindanao



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Stage 2 Green Assessment (GA): Training on Ground -truthing for GA through a Remotely Piloted Aircraft System

Prepared by: Center for Conservation Innovation Ph., Inc for the USAID SIBOL Activity

Training Date: July 31, 2023 to August 4, 2023 (Luzon Cluster); August 7 to 11, 2023 (Visayas-Mindanao Cluster)

Training Venue: Luzon cluster - Pampanga (venue TBA); Visayas-Mindanao Cluster - Cebu (venue TBA)

Training Type: face-to-face meeting

Training Objectives:

This training specifically aims to engage the participants in:

1. developing an aerial survey plan for ground-truthing to validate the land cover status after undergoing an extreme event and collect the necessary reference polygons for damage assessment and detect land-cover changes;
2. understanding the principles of ground-truthing through aerial surveys;
3. understanding the use of a Remotely Piloted Aircraft System (RPAS) and ground control points (GCPs) for ground-truthing; developing orthomosaic images from RPAS photography;
4. interpreting land cover classes from orthomosaic images and assessing accuracy; and
5. forming RPAS sub-teams and developing a schedule for each to cover the training polygons located on the ground.

Training Process:

This training is good for a duration of five days. This will consist of recollection of the process to develop a survey plan, concepts about aerial ground truthing, setting-up of ground control points and the base station, drone image processing, on-field training and fieldwork planning.

Training Program:

Date/Time	Topic	Duration	Resource person
	Day 0 (Sunday)		
	Arrival of facilitators and participants; Preparation		
	Day 1 (Monday)		
Program will commence by 9:00 AM			
08:30 AM to	Registration and arrival of participants		

Date/Time	Topic	Duration	Resource person
9:00 AM			
9:00 AM to 9:05 AM	Opening Prayer	5 mins	SIBOL Facilitator
9:05 AM to 9:10 AM	Opening Remarks	5 mins	DENR Climate Change Service
9:10 AM to 9:20 AM	Welcome Remarks	10 mins	DENR Regional Executive Director
9:20 AM to 9:30 AM	Message from SIBOL	10 mins	SIBOL Chief of Party
9:30 AM to 10:00 AM	Introduction of Participants	30 mins	Participants
10:00 AM to 10:10 AM	Introduction of Facilitators	10 mins	Dr. Oliver G. Coroza; Kristine Andaya; Daniel Glenn Darapiza; Regina Aedrienne Felismino-Inovejas; Czeskian Realo SIBOL Facilitators
10:10 AM to 10:40 AM	Introduction to SIBOL Green Assessment	30 mins	Jennica Paula Masigan SIBOL Facilitator
10:40 AM to 12:25 PM	Lecture Series 1.1: Green Assessment transition from Stage 1 to Stage 2 <ul style="list-style-type: none"> ● Pre-Stage 2 preparation steps at Stage 1 rapid assessment; ● Review of creating reference points and training polygons for aerial survey planning ● Land cover classification for Green Assessment 	1 hour 45 mins	Dr. Oliver G. Coroza; Kristine Andaya; Regina Aedrienne Felismino-Inovejas SIBOL Facilitator
12: 25 PM to 1:25 PM	Lunch	1 hour	
1: 25 PM to 3:10 PM	Lecture Series 1.2: Preparations for Stage 2 mapping <ul style="list-style-type: none"> ● Reference points map 	1 hour 45 mins	Dr. Oliver G. Coroza; Kristine Andaya SIBOL Facilitator
3:10 PM to 5:00 PM	Activity 1: Preparations for Stage 2 mapping <ul style="list-style-type: none"> ● Review the preliminary map of reference points developed in Stage 1 to guide the ground- 	1 hour 50 mins	Participants (Note: Each region has to bring to the session the rapid assessment map developed in Stage 1 for review and planning)

Date/Time	Topic	Duration	Resource person
	truthing/validation surveys; <ul style="list-style-type: none"> ● Develop and agree on the land cover classes to comprise the main map to be used for Stage 2; and ● Develop a plan for GT using either the traditional walk-through of ground surveys or rapid survey through RPAS. 		
Day 2 (Tuesday)			
Program will commence by 9:00 AM			
8:30 AM to 9:00 AM	Registration & Attendance	30 mins	Dr. Oliver G. Coroza; Kristine Andaya; Daniel Glenn Darapiza; Regina Aedrienne Felismino-Inovejas; Czeskian Realo SIBOL Facilitator & Participants
9:00 AM to 10:00 AM	Continuation of Activity 1: Preparations for Stage 2 mapping	1 hour	Participants
10:00 AM to 12:00 AM	<ul style="list-style-type: none"> ● Deliver presentations for the following activities : ● Activity 1: Preparations for Stage 2 mapping 	2 hours	Dr. Oliver G. Coroza; Kristine Andaya; Daniel Glenn Darapiza; Regina Aedrienne Felismino-Inovejas; Czeskian Realo SIBOL Facilitator & Participants
12:00 NN to 1:00 PM	Lunch		
1:00 PM to 1:20 PM	Lecture Series 2.1: Ground-truthing by Aerial survey <ul style="list-style-type: none"> ● Remotely Piloted Aircraft (RPA) vs Remotely Piloted Aircraft System (RPAS) ● Importance of using RPAS in conservation 	20 mins	Daniel Glenn Darapiza SIBOL Facilitator

Date/Time	Topic	Duration	Resource person
1:20 PM to 4:00 PM	Lecture Series 2.2: The basic fundamentals and moves in flying drones	2 hours 40 mins	Daniel Glenn Darapiza SIBOL Facilitator
4:00 PM to 5:00 PM	Lecture Series 2.3: Typical RPAS mapping workflow <ul style="list-style-type: none"> ● Project Design <ul style="list-style-type: none"> ○ Training data points (from the pre-processed contemporary land cover and cover change analysis) ○ Area of interest ○ Maps ● Reconnaissance <ul style="list-style-type: none"> ○ Activities ○ List of equipment ● Flight planning <ul style="list-style-type: none"> ○ Manual flight or using flight planning software ○ Pix4D mapper App 	1 hour	Regina Aedrienne Felismino-Inovejas SIBOL Facilitator
Day 3 (Wednesday)			
Program will commence by 9:00 AM			
8:30 AM to 9:00 AM	Registration & Attendance	30 mins	Dr. Oliver G. Coroza; Kristine Andaya; Daniel Glenn Darapiza; Regina Aedrienne Felismino-Inovejas; Czeskian Realo SIBOL Facilitator & Participants
9:00 AM to 9:30 AM	Recap	30 mins	
9:30 AM to 11:00 AM	Continuation of Lecture Series 2.3: Typical RPAS mapping workflow <ul style="list-style-type: none"> ● Ground control point/ base station <ul style="list-style-type: none"> ○ GCP marker ○ Trimble ○ Hand-held GPS ● Aerial survey acquisition <ul style="list-style-type: none"> ○ Pre-flight preparations ○ Last minute revisions of flight plan ○ Actual flight ○ Post-flight 	1 hour 30 mins	Regina Aedrienne Felismino-Inovejas SIBOL Facilitator

Date/Time	Topic	Duration	Resource person
	<ul style="list-style-type: none"> o List of equipment 		
11:00 AM to 11:30 AM	Lecture Series 3: Requisite during flight survey <ul style="list-style-type: none"> ● Forms ● Checklists 	30 mins	Regina Aedrienne Felismino-Inovejas SIBOL Facilitator
11:30 AM to 12:30 AM	Lecture Series 4: Post-flight requisite <ul style="list-style-type: none"> ● Flight logs data tracker ● Data cleaning ● Data filing 	1 hour	Regina Aedrienne Felismino-Inovejas SIBOL Facilitator
11:30 AM to 12:00 NN	Lecture Series 5: Establishing Ground Control Points <ul style="list-style-type: none"> ● Importance and component of GCPs ● Briefing on the sub-meter accuracy GPS and its importance ● Trimble Mobile Manager configuration ● Trimble Catalyst DA1 setup 	30 mins	Czeskian Realo SIBOL Facilitator
12:30 PM to 1:30 PM	<ul style="list-style-type: none"> ● Lunch 		
1:30 PM to 2:00 PM	Lecture Series 6: Real Time Kinematic (RTK) aerial surveying <ul style="list-style-type: none"> ● Workflow of using the RTK enabled RPA ● Factors to consider in using an RTK enabled RPA ● Process of data collection ● DJI Phantom 4 RTK & base station set-up ● Processing using the DJI Terra software 	1 hour 30 mins	Daniel Glenn Darapiza SIBOL Facilitator
2:30 PM to 4:30 PM	Lecture Series 7: Rule of Thumb on Ground truthing through RPAS	1 hour 30 mins	Regina Aedrienne Felismino-Inovejas SIBOL Facilitator
4:30 PM to 4:45 PM	Preparations for on-field calibration	15 mins	Czeskian Realo; SIBOL Facilitator & Participants
Day 4 (Thursday)			
Program will commence by 7:00 AM			

Date/Time	Topic	Duration	Resource person
7:00 AM to 12:00 NN	Registration, Attendance and Transport	5 hours	Dr. Oliver G. Coroza; Kristine Andaya; Daniel Glenn Darapiza; Regina Aedrienne Felismino-Inovejas; Czeskian Realo SIBOL Facilitator & Participants
	On- Field calibration <ul style="list-style-type: none"> The basics, fundamentals and moves in flying drones 		
12:00 NN to 1:00 PM	Lunch	1 hour	
1:00 AM to 5:00 PM	On- Field calibration <ul style="list-style-type: none"> Ground truthing through RPAS hands-on application 	5 hours	
	Activity 2: Ground truthing through RPAS <ul style="list-style-type: none"> RPAS survey methodologies 		
Day 5 (Friday)			
Program will commence by 9:00 AM			
8:30 AM to 9:00 AM	Registration and Attendance	30 mins	Dr. Oliver G. Coroza; Kristine Andaya; Daniel Glenn Darapiza; Regina Aedrienne Felismino-Inovejas; Czeskian Realo SIBOL Facilitator & Participants
9:00 AM to 10:00 AM	Lecture Series 8: Data pre-processing using Pix4D mapper software	1 hour	Daniel Glenn Darapiza SIBOL Facilitator
	Activity 3: Data pre-processing using Pix4D mapper software		
10:00 AM to 10:15 AM	Lecture Series 9: Sample Interpretation of drone orthomosaic images based on the Land cover classification for Green Assessment through visualization	15 mins	Daniel Glenn Darapiza SIBOL Facilitator & Participants
10:15 AM to 11:30 NN	Prepare presentations for the following activities : Activity 2: Ground truthing through RPAS Activity 3: Data pre-processing using Pix4D mapper software Post - evaluation Form	1 hour 15 mins	Dr. Oliver G. Coroza; Kristine Andaya; Daniel Glenn Darapiza; Regina Aedrienne Felismino-Inovejas; Czeskian Realo SIBOL Facilitator & Participants

Date/Time	Topic	Duration	Resource person
11:30 AM to 1:00 PM	Lunch		
1: 00 PM to 2:15 PM	<p>Deliver presentations for the following activities :</p> <p>Activity 2: Ground truthing through RPAS</p> <p>Activity 3: Data pre-processing using Pix4D mapper software</p>	1 hour 15 mins	<p>Dr. Oliver G. Coroza; Kristine Andaya; Daniel Glenn Darapiza; Regina Aedrienne Felismino-Inovejas; Czeskian Realo SIBOL Facilitator & Participants</p>
2:15 PM to 2:45 PM	Q&A: Participants remarks regarding the training	30 mins	<p>Dr. Oliver G. Coroza; Kristine Andaya; Daniel Glenn Darapiza; Regina Aedrienne Felismino-Inovejas; Czeskian Realo SIBOL Facilitator & Participants</p>
2:45 PM to 3:15 PM	Distribution of Certificate of Appearance and Certificate for Completion of Training	30 mins	SIBOL Facilitators & Participants
3:15 PM to 3:30 PM	Closing remarks	15 mins	DENR CCS representative / SIBOL Representative

Training Requirements for the participants:

1. Stage 1 output from the SIBOL Green Assessment: Remote Sensing Training and GIS Vorkshop
2. Computer/ Workstation;
 - a. Minimum Requirements:
 - i. Hard drive: at least 500 HDD
 - ii. Memory: at least 32GB RAM
 - iii. Processor type: at least Intel core i7 processor
 - iv. 32/64 bit
 - v. Operating system: at least Windows 7
 - b. Download mobile apps (Android: Playstore & Iphone: Apple Store)
 - i. Pix4D capture;
 - ii. CTRL+DJI;
 - iii. Windy;
 - iv. UAV Forecast;
 - v. DJI Go 4;
 - c. Download software
 - i. QGIS; and
 - ii. Pix4D mapper;
3. Remotely Piloted Aircraft/ Drone (*please bring if you have an equipment*);
4. Hand-held GPS
5. Sub-meter level precision GNSS receiver;
6. Binoculars;
7. Drone extra batteries;
8. External hard drive (optional);

Training Qualifications for the participants:

1. Team composition: at least one of the three participants from each office should have been a participant of the Green Assessment Stage 1 Training of Trainers, one PENRO representative, one CENRO representative
2. Natural Sciences, forestry or engineering background
 - with primary institutional function to conduct remote-piloted aerial or land mapping surveys
 - who knows how to use & read GPS and GNSS equipment
 - able to exercise the function to overlay and manipulate spatial layers in different mapping software



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SPECIAL ORDER

No. 2023 - _____

SUBJECT: AUTHORIZING THE ATTENDANCE OF BUREAU AND REGIONAL PARTICIPANTS TO THE CONDUCT OF CAPACITY DEVELOPMENT ON AERIAL GROUND TRUTHING - SECOND STEP OF THE GREEN ASSESSMENT FRAMEWORK

In the interest of service for green resilience planning to improve the protection, conservation, and sustainable use of ecosystem and ecosystem services, the conduct of Ground Validation Surveys - Aerial Ground Truth Survey - Second Step of the Green Assessment is hereby authorized to be held on July 31-August 4 (Luzon Cluster) and August 7-11, 2023 (Visayas-Mindanao Cluster) in Region 3 and Region 7.

The following personnel are hereby authorized to attend and actively participate in the training workshop:

OFFICE	PARTICIPANTS
Luzon Cluster	
Forest Management Bureau	3
Biodiversity Management Bureau	3
Mines and Geosciences Bureau	3
Ecosystems Research and Development Bureau	3
National Mapping and Resource Information Authority	3
Knowledge and Information Systems Service	3
Policy and Planning Service	3
Climate Change Service	3
Region I	3
Region II	3

CAR	3
Region III	3
NCR	3
Region IV-A	3
Region IV-B	3
Region V	3
Visayas-Mindanao Cluster	
Policy and Planning Service	3
Climate Change Service	3
Region VI	3
Region VII	3
Region VIII	3
Region IX	3
Region X	3
Region XI	3
Region XII	3
Region XIII	3

All expenses to be incurred in relation to the activity including honoraria of the resource persons, food and accommodation expenses will be covered by USAID SIBOL.

Travel expenses of chosen representatives from and to their place of assignments and other allowable expenses shall be charged against respective office funds, subject to usual accounting and auditing rules and regulations.

As such, the Climate Change Service (CCS) shall take the lead in coordination and preparation of the overall activity in collaboration with the United States Agency for International Development Sustainable Interventions for Biodiversity, Oceans and Landscape (USAID SIBOL) of the training for green assessment of provinces.

The Climate Change Service Director is hereby authorized to amend and/or reschedule the above-mentioned activities and shall properly advise the Human

Resource Development Service of any changes in schedule and/or venue in case of conflict with other activities of the Department.

A report shall be submitted online (bit.ly/LNDportal) by the Climate Change Service to the undersigned through the Human Resource Development Service - Training and Development Division, fifteen (15) working days after the completion of the activity.

This Order takes effect on the dates specified herein.

ATTY. IGNATIUS LOYOLA A. RODRIGUEZ

OIC, Office of the Undersecretary for Organizational
Transformation and Human Resources and Undersecretary
for Special Concerns and Legislative Affairs

DRAFT SPECIAL ORDER