



MAY 08 2025



DENR Administrative Order
No. 2025 - 16

**SUBJECT: GUIDELINES ON THE INVENTORY OF STRUCTURES
WITHIN FOREST LANDS**

Pursuant to Presidential Decree (P.D.) No. 705, as amended, otherwise known as the "Revised Forestry Code of the Philippines", Executive Order (E.O.) No. 192, series of 1987, "Providing for the Reorganization of the Department of Environment, Energy and Natural Resources, renaming it as the Department of Environment and Natural Resources, and for Other Purposes", E.O. No. 263, series of 1995, "Adopting Community-Based Forest Management as the National Strategy to Ensure the Sustainable Development of the Country's Forestlands Resources and Providing Mechanisms for Its Implementation", R.A. No. 7586 as amended by R.A. No. 11038, known as the "Expanded National Integrated Protected Area System (ENIPAS) Act of 2018, R.A. No. 8371 known as the "The Indigenous Peoples' Rights Act (IPRA) of 1997, and other pertinent laws, rules, and regulations, the following guidelines and procedures on the inventory of structures in forest lands are hereby promulgated for the guidance and compliance of all concerned.

SECTION 1. Basic Policy. It is the policy of the state to ensure the sustainable use, management, protection, conservation, and enhancement of the country's environment and natural resources as well as to ensure equitable sharing of the benefits derived therefrom for the welfare of the present and future generations. Towards this end, the State shall pursue the development of the country's forest lands through the advancement of science and technology.

SECTION 2. Objectives. This Order aims to provide guidance for the conduct of inventory of structures within forest lands using geospatial technologies such as Geographic Information System and Remote Sensing; and in situ validation using offline data collection tools. Specifically, this Order aims to:

- 2.1 Systematically identify and document all existing structures within forest lands, including their type, size, and status, to produce baseline data and information;
- 2.2 To integrate inventory data with Geographic Information Systems (GIS) and remote sensing technologies for better visualization and analysis; and
- 2.3 Ensure that inventory findings are documented and reported transparently, facilitating informed decision-making.

SECTION 3. Scope and Coverage. This Order shall cover the inventory of all structures, both vertical and horizontal, within forest lands. It shall collect data on the structure's type, status, the material used in construction, basis of occupation, the owner/ holder or any person responsible for the establishment of the structure, geographical location, and geotagged photos, among others.

SECTION 4. Definition of Terms. As used in, and for the purpose of this guidelines, the following terms and phrases shall be understood to mean:

- 4.1. **Built-up areas** - refers to the areas classified as built-up under the land cover map of National Mapping and Resources Information Authority (NAMRIA). These areas are characterized by intensive use of the land covered with structures and developments. It includes cities, towns, villages, strip developments along highways, transportation, power, and communication facilities, and areas occupied by malls, shopping centers, etc.
- 4.2. **Certificate of Ancestral Domain Title (CADT)** - refers to a title formally recognizing the rights of possession and ownership of ICCs/IPs over their ancestral domains identified and delineated in accordance with the IPRA Law or RA No. 8371.
- 4.3. **Certificate of Ancestral Lands Title (CALT)** - refers to a title formally recognizing the rights of ICCs/IPs over their ancestral lands. Any issued CALT shall be subject to the condition that the said ancestral land cannot be sold, disposed or destroyed except with respect to the ICCs/IPs' right to transfer land or their property rights to/among members of the same ICCs/IPs in accordance with their customary laws and traditions, as provided for under Section 8A of IPRA and its IRR.
- 4.4. **Forestry Spatial Datasets (FSD)** - refers to the datasets being managed by the forestry sector such as but not limited to forestry tenurial instruments, national greening program sites, critical and proclaimed watersheds, potential investment areas, production and protection forests, illegal logging hotspots, apprehensions and/or seizures, Lawin forest conservation areas, cutting permits, etc.
- 4.5. **Forest Lands** - refer to the lands of the public domain which includes the public forest, the permanent forest or forest reserves, and forest reservations [Revised Forestry Code]. For the purpose of this Order, forest lands shall include unclassified public forests.
- 4.6. **Geographic Information System (GIS)** - a system that creates, manages, analyzes, and maps all types of data.
- 4.7. **Offline Data Collection Tool (ODCT)** - refers to data collection tools that are made freely available which can be distributed, modified and used without internet connection. The ODCT referred to in this Order is ArcGIS Survey123.
- 4.8. **Remotely Piloted Aircraft (RPA)** - refers to any unmanned aircraft which is piloted from a remote station. It is also synonymous with aerial drones and unmanned aerial vehicles (UAVs). This includes quadcopter, VTOL and other similar technologies.

- 4.9. **Regional FSD Management Team** - refers to the team in the Regional Offices responsible for the management, consolidation, and submission of FSD. In most cases, this is composed of the Regional GIS Focal/s.
- 4.10. **Satellite imagery** - data collected by sensors on satellite platforms, typically of earth. Sensors can be both active and passive; satellite imagery often consists of multiple bands. The metadata includes characteristics such as sensor position and pointing geometry, sensor gain and bias, acquisition date and time, and associated data.
- 4.11. **Structures¹** - refers to any vertical and horizontal improvement or development, which are permanent or temporary, affixed to the land excluding plantations and reforestation projects.
 - 4.11.1. **Permanent Structure** - improvement or development which are permanently affixed to the land in a manner that these cannot be separated therefrom without damage thereto.
 - 4.11.2. **Temporary Structure** - improvement or development which can be removed without causing any damage to the land and to which the same has been attached.
- 4.12. **Tenure** - guaranteed peaceful possession and use of specific forest and land area and the resources found therein, covered by an agreement, contract or grant which cannot be altered or abrogated without due process.
- 4.13. **Tenure Compliance Monitoring** - refers to the monitoring and evaluation conducted by DENR personnel to ensure the adherence of the tenure holders in the terms and conditions stipulated in the agreement as well as monitoring and evaluation of the developments and improvements introduced in the area.
- 4.14. **Tenured Forest Lands** - this refers to the forest land areas covered with forestry tenure instruments
- 4.15. **Unclassified Public Forest** - is the mass of lands of the public domain which has not been the subject of the present system of classification for the determination of which lands are needed for forest purposes and which are not.
- 4.16. **Untenured Forest Lands** - refers to forest land areas which are outside CADT/CALT and tenured forest lands and are further classified into the following:
 - 4.16.1. **Other land cover** - refers to the land classified as built-up, open/ barren, shrubs, grassland, annual crop, marshland, mangrove forest, fishponds and inland water [land cover map of NAMRIA]
 - 4.16.2. **Forest cover** - for the purpose of this DAO, this refers to land classified as closed and open forest [land cover map of NAMRIA]
 - 4.16.2.1. **Open Forest** - These are formations with discontinuous tree layers with a coverage of at least 10 percent and less than 40 percent.

¹ Based on the definition of 'improvements' from DAO 2004-59

- 4.16.2.2. **Closed Forest** - These are formations where trees in the various storeys and the undergrowth cover a high proportion greater than or equal to 40 percent (≥ 40 percent) of the ground and do not have a continuous dense grass layer.
- 4.16.3. **Perennial cropland** - refers to the land classified perennial by the land cover map of NAMRIA. Land cultivated with long term crops that do not have replanted for several years after each harvest; harvested components are not timber but fruits, latex and other products that do not significantly harm the growth of the planted trees or shrubs; orchards, vineyards etc.

SECTION 5. Inventory of Structures within Forest Lands. The inventory of structures within forest lands shall be conducted to determine and account for the number of existing structures within forest lands, the projection on how built-up areas progress in terms of expansion in the area per year, and the list of factors that may have contributed to the construction of built-up areas inside the forest.

- 5.1. **Location of Structures.** Structures within forest lands are classified into six (6) categories based on location in aid of the methodology to be employed:
 - 5.1.1. Untenured forest lands and within perennial croplands;
 - 5.1.2. Untenured forest lands with forest cover and 0-18% slope;
 - 5.1.3. Untenured forest lands with forest cover and above 18% slope;
 - 5.1.4. Untenured forest lands with other land cover types;
 - 5.1.5. Untenured forest lands and CADT/CALT areas; and
 - 5.1.6. Tenured forest lands.
- 5.2. **Initial Data Requirements.** The following are the minimum spatial data needed in the inventory of structures within forest lands:
 - 5.2.1. Forest land boundary using the legal land classification maps of the National Mapping and Resource Information Authority (NAMRIA);
 - 5.2.2. Unclassified public forests from NAMRIA;
 - 5.2.3. Forestry Tenure instruments from FMB and DENR Regional Offices;
 - 5.2.4. Latest land cover map from NAMRIA;
 - 5.2.5. Ancestral lands with Certificate of Ancestral Domain Title (CADT)/ CALT from the National Commission on Indigenous Peoples;
 - 5.2.6. Land Administration and Management System (LAMS) data specifically shapefiles of titled lands, from the Land Management Bureau;

5.2.7. Mining tenements from the Mines and Geosciences Bureau;
and

5.2.8. Legislated protected areas from the Biodiversity
Management Bureau.

5.3. **Information on Collection Requirements.** The following are the minimum information required for the ground survey as shown in the survey questionnaire provided in the offline data collection tool.

- a. Name of Regional Jurisdiction
- b. Name of PENRO Jurisdiction
- c. Name of CENRO Jurisdiction
- d. Name of Congressional District
- e. Name of Municipality/City Jurisdiction
- f. Team Number
- g. Enumerator Code
- h. Methodology used in identifying structures (Satellite Imagery, ODCI and/or drone survey, tenure compliance monitoring)
- i. Location of Structures provided in Section 5.1
- j. Type of structure (house, power lines, storage facility, etc.)
- k. Reference Year/Year Constructed
- l. Vertical height in terms of no. of floors
- m. Estimated area of the structures in square meters
- n. Type of material used in construction (brick, wood, mixed, etc)
- o. Structure's Use (e.g. abandoned, residential, commercial, residential and commercial, industrial, institutional)
- p. Geographical Location of the structure
- q. Classification of Structure (permanent, temporary)
- r. Name of owner or contact person
- s. Photo/Image of structure
- t. Other relevant information
- u. Basis of occupation and reference year (i.e. tax declaration, TCT, Business permit)
- v. LC Map and FAO Number.

Recording of the location of structures shall meet the requirement of five to ten meters (5-10 m) accuracy using the geographical coordinate system - WGS84.

Except for the province of Palawan whose standard projection is PRS 1992 UTM Zone 50N, the PRS 1992 UTM Zone 51N shall be adopted as the standard projection for the final shapefiles for submission under this Order.

SECTION 6. General Procedure in the Conduct of Inventory. The inventory shall undergo the following main activities:

- 6.1. **Determination of Universe and Development of Survey Tool.**
The universe for the inventory shall be the total forest land area of the country. The forest land area data shall be processed using

GIS to determine the method of data collection (satellite imagery analysis, in-situ data collection and drone survey, and secondary data collection from tenure compliance reports).

Data processing shall involve the inclusion of Unclassified Public Forest (UPF) and the exclusion of legislated protected areas under RA 11038 (the Expanded National Integrated Protected Areas System Act) from the Forest Land Boundary provided by BMB, mining tenements from the MGB, and if needed, titled lots from the LMB to generate the total forest land area or the universe. The generated forest land area shall then be divided into two categories: tenured and untenured forest lands.

The untenured forest lands shall be divided further into five categories by overlaying the CADT/CALT map from NCIP and the land cover and slope map from NAMRIA (Annex 1.1). The disaggregated untenured forest lands shall be inventoried using two methodologies as discussed in Section 6.2 and 6.3. The tenured forest lands shall be inventoried using secondary data from tenure compliance monitoring reports.

The FMB shall produce an indicative universe from the aforementioned process and it shall be vetted by the Regional Office (RO). This shall serve as the final universe (Annex 1.2).

Additionally, the FMB shall develop and design the survey tool using ArcGIS Survey123.

- 6.2. **Satellite Imagery Analysis.** This approach entails analyzing satellite imagery sourced from open image repositories. The Regional Technical Working Group (RTWG) shall identify and characterize structures within various land cover types, including built-up areas, open and closed forests with slopes exceeding 18%, and CADT/CALT areas within forest lands (Annex 1.3). For each visible structure, points and polygons are generated based on the information extracted from the satellite imagery.
- 6.3. **In-Situ Data Collection and Validation and Drone Image Analysis.** The final approach involves the gathering of data and information from the ground by the Ground Validation Team using ArcGIS Survey123 in untenured forest lands specifically within perennial croplands, open and closed forests with below 18% slope (Annex 1.3). ODCI provides smartforms that can be installed on Android/iOS devices that require no internet connection during the survey. The data requirements included in the smartforms are specified in Section 5.3 and the user interface can be found in Annex 2.

It shall collect data on the structure's type, use, status, material used in construction, the owner/ holder or any person responsible for the establishment of the structure, basis of occupation,

geographical location, and geotagged photos. The desired accuracy for the location point shall be within the range of 5-10 m.

In situations where conducting an on-site survey is not feasible due to inaccessibility (i.e. ravine or cliff areas), drone image analysis shall be employed. The ortho-mosaic images shall be used to count and digitize the structures considering the steps on satellite imagery analysis.

- 6.4. **Inventory of Structures within Tenured Areas.** Available geospatial data and information related to structures within tenured areas will be obtained from the compliance monitoring of the Enforcement Division vis-a-vis the submitted Comprehensive Development and Management Plans (CDMP) from Licenses, Patents, and Deeds Division.

The FMB shall provide supplementary guidelines on the inventory of structures within tenured areas if the need arises.

The identified methodology to be used is presented in Annex 3.

- 6.5. **Prioritization of Inventory.** The inventory process will prioritize structures within untenured forest lands and those outside of CADT/CALT areas. For structures within perennial croplands and forested areas (both closed and open forests) with slopes below 18%, the ODCT survey tool and/or drones will be used for data collection. On the other hand, structures within other land cover types, open and closed forests with slopes above 18%, as well as those within built-up and CADT/CALT areas, will be assessed using satellite imagery.

SECTION 7. Creation of Regional Technical Working Group (TWG) and Ground Validation Teams. The Regional Office shall create a TWG and Validation Team through the Issuance of a Regional Special Order, which shall compose of the following:

7.1. Regional TWG

Overall Lead:	Assistant Regional Director for Technical Services
Assistant Lead:	Chief, Surveys and Mapping Division
Members:	Chiefs and Technical Staff from the following Divisions:

Enforcement Division
Licenses, Patents, and Deeds Division
Planning & Management Division
Conservation and Development Division
Surveys and Mapping Division
Legal Division
Regional NGP Coordinator

Regional GIS Focal and/or Control Map Focal

The Regional TWG may invite other representatives as deemed necessary.

7.2. Ground Validation Teams

The Ground Validation Teams shall be composed of the following:

	Implementing PENRO	CENRO
Lead	Chief, Technical Services Division	CENR Officer
Assistant Lead		DMO IV
Members	PENRO GIS Focals One (1) Technical Staff, Monitoring and Enforcement Section One (1) Technical Staff, Regulation and Permitting Section One (1) Technical Staff, Conservation and Development Section	CENRO GIS Focals One (1) Technical Staff, Monitoring and Enforcement Section One (1) Technical Staff, Regulation and Permitting Section One (1) Technical Staff, Conservation and Development Section

SECTION 8. Roles and Responsibilities. The following offices shall have the following roles and responsibilities for the inventory of structures in forest lands:

- 8.1. **The Forest Management Bureau (FMB)** shall conduct the initial analysis of the universe and categorize the structures according to the location of structures as per Section 5.1. of this Order. The FMB shall provide the analyzed data to the Regional Offices. The FMB shall also develop, design and provide the ODCT smartforms to the CENRO/ Implementing PENROs.
 - 8.1.1. **Determination of boundaries based on Section 5.1.** The FMB shall provide the indicative boundaries for tenured forest lands, CADT/CALT areas and untenured forest lands to the Regional Offices and shall ensure that these three (3) major boundaries are exported separately since the inventory methodology of structures within these areas of interest vary.
 - 8.1.2. **Creation of the universe of the Inventory.** Using the data derived from Section 6.1, the FMB shall create the initial universe of the inventory ensuring no overlaps among the boundaries. The regional boundaries shall be derived from the land cover map of NAMRIA. The FMB together with the

Regional Offices shall reconcile their respective data and finalize the universe.

The final universe vetted by the FMB and the RO shall be the basis for planning the three-year implementation of the inventory.

- 8.2. **The Regional TWG** shall be responsible for the consolidation and submission of data on the inventory of structures. The Regional TWG shall also be responsible in the identification of structures within other land cover types, forest cover with above 18% slope, and CADT/CALT areas using satellite imagery analysis.

8.2.1. **Designation of Lead Division.** The Surveys and Mapping Division shall be designated as the Lead Division. The Lead Division shall facilitate the consolidation of data on structures and shall mobilize the identified ground validation team members in Section 7.1;

8.2.2. **Consolidation of inventory data.** The Regional TWG shall consolidate all spatial data on structures which shall include the data gathered using ODCT and/or drone survey, and satellite imagery analysis, and tenured forest lands.

8.2.3. **Identification of Structures using Satellite Imagery Analysis.** The Regional TWG shall conduct satellite imagery analysis within the boundaries of other land cover types outside tenure, closed and open forests above 18% slope and CADT/ CALT areas, to identify structures within these areas. Points and polygons shall be created for each visible structure using satellite images. Information to be gathered shall only be limited to the number of structures and other relevant information that can be identified.

8.2.4. **Monitoring of Ground Validation Team Accomplishment.** The Regional TWG shall be responsible in determining the accomplishment of the Ground Validation Team based on the implementation plan of their respective Regions.

- 8.3. **The Ground Validation Team** shall carry out the ground inventory through the conduct of ODCT surveys within perennial croplands, open and closed forests below 18% slope.

8.3.1. **Inventory of structures using ODCT.** The Ground Validation Team shall be responsible for gathering first-hand data and information about structures as identified in Section 5.3 of this Order. The inventory shall implement the smartforms created and provided by FMB.

The team shall conduct the survey by municipality and shall ensure the completion prior to moving to another municipality. The team shall ensure that the inventory is properly coordinated with the concerned Local Government Unit (LGU). The Team may also gather other relevant

information from the LGUs, such as business permits, tax maps, land use maps, among others.

- 8.3.2. **Aerial validation using drones.** The Team may opt to use aerial validation using drones for areas where entry is not feasible (such as presence of ravines and creeks). The team shall conduct the planning of drone flight validation adopting the protocols set in FMB Technical Bulletin No. 35.

8.3.2.1. *Drone Survey.* The existing Protocol on the Use of Quadcopter Remotely Piloted Aircraft (RPA) in the Monitoring and Assessment of Forestry, Environment, and Natural Resources Programs and Projects is hereby adopted as the official methodology from pre-flight, in-flight, and post-flight operations, as well as the image processing of the aerial photographs acquired in the drone survey.

8.3.2.2. *GIS Analysis from Acquired Images from Drone.* The ortho-mosaic images from the drone survey shall be used to digitize the structures.

8.3.2.3. *Areas Restricted to Drone Surveys.* No drone surveys shall be conducted within a 10-kilometer radius of the airport. Only the inventory using an ODCCT Survey shall be performed in these areas.

- 8.3.3. **Review, Consolidation, and Submission of ODCCT Survey Report.** The ground validation team shall submit the gathered data and information with analysis and recommendations for immediate appropriate actions (if any) to the concerned PENRO. The concerned PENRO shall review, consolidate, and submit the same to the Regional TWG.

In the case of Implementing PENRO, they shall directly submit to the Regional TWG.

Data collected (in shapefiles) shall be uploaded through the FSD Portal.

SECTION 9. Reporting and Uploading of Inventory Data to the FSD Portal and the DENR Control Map. The inventory output will form part of the Regional Offices' FSD submission (Annex 5). The submission of output shall be done by the Supervising and Implementing PENRO/s. The Regional FSD Management Team and the FMB Geospatial Data Management Team (GDMT) shall be responsible for conducting the quality control and quality assurance of the submitted data. The timeline of report submission shall be as follows:

9.1. Reporting

There are three (3) reports required under this Order. The timeline of submission shall be as follows:

Report	Focus	Content	Timeline of Submission	Responsible
Interim Progress	Initial progress and early observations	Summary of early activities, preliminary data, recommended course of actions in general terms	Monthly (every 10th of the ensuing month)	Ground Validation Team to Regional Executive Director thru the RTWG
Progress	Comprehensive view of current status/ Detailed ongoing update	Detailed tasks, data, challenges, stakeholder engagement, financials, next steps	Semi-annual (every end of July and end of January)	RTWG to RED; RED to FMB
Final	Entire project lifecycle and outcomes	Summary of all activities, final data, challenges, financials, conclusions, recommendations	End of activity	RTWG to RED; RED to FMB

a. Interim Progress Report. The Interim Progress Report shall be prepared on a monthly basis, by the Ground Validation Team to be submitted to the Regional Executive Director thru the Assistant Regional Director for Technical Services. The report shall include a summary of activities completed so far, preliminary data, challenges encountered, and any adjustments needed. It shall emphasize the initial progress, early observations, and recommendations to aid in identifying any immediate issues or necessary changes in the conduct of the activity. The template for the report format is shown in Annex 6.

b. Progress Report. The Regional TWG shall submit a progress report semi-annually through a Memorandum to the Regional Executive Director every end of July and January which details their accomplishment from January to June and July to December, respectively. The Regional Executive Director shall then endorse the progress report to the Forest Management Bureau. The report shall provide a comprehensive view of the project's current status to include detailed information on the completed and ongoing tasks, data and compiled findings, challenges and mitigation strategies, stakeholder engagement, financial, and recommendations.

If the survey for a particular province is still ongoing at the time of reporting, the RTWG shall include the percentage of

accomplishment and target completion. The progress report format is shown in Annex 7.

- c. **Final Report.** The Regional TWG shall submit the final report to the Regional Executive Director through a Memorandum at the end of three (3) years which summarizes the entire inventory upon completion, providing a comprehensive overview of all activities, findings and outcomes and shall then be submitted to the Forest Management Bureau. The final report format is shown in Annex 8.

9.2. **Uploading of Inventory Data to the FSD Portal and The DENR Control**

Aside from the technical reports to be submitted for the inventory, the corresponding geospatial datasets should be uploaded to the FSD Portal.

- 9.2.1. **Data Attribution.** The information to be included in the shapefiles of the structures within forest lands shall follow the format as shown in Annex 4. For data on structures gathered using satellite imagery analysis and tenured forest lands, only the attributes on geographical location, methodology used, and other relevant information shall be identified. Other information such as the ones gathered using ODCI may be left blank.
- 9.2.2. **Creation of FSD Portal Regional Accounts.** The FMB shall provide the ROs with their respective FSD Accounts to be used for the uploading of their respective inventory data.
- 9.2.3. **Data Uploading.** The Ground Validation Team shall upload their survey data in the FSD Portal using their respective regional accounts for ArcGIS Survey123. This shall serve as means of verification of accomplishment. If the ground validation team conducted inventory through drone images, an accomplishment report shall be submitted through a Memorandum to the Regional Office including shapefiles and map layout. This is also the same with the structures' data collected from tenured forest lands. Said accomplishments shall be consolidated by the RTWG.

SECTION 10. Capacity Building. The FMB, in coordination with the Geospatial Database Office, shall conduct the roll-out and provide capacity-building activities to the DENR Regional and Field Offices to ensure that the activities in the field shall be conducted correctly and efficiently relative to the operations stated herewith.

SECTION 11. Duration. Within three (3) years of the effectivity of this Order, the FMB and the RO shall complete the baseline inventory of structures within forest lands. In the event that the target area cannot be accomplished within the three (3) year activity, the Regional Office through a Memorandum addressed to the FMB Director shall officially request for extension including the area coverage and justification.

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For the succeeding years, the inventory shall be included in the regular monitoring activities of the regional offices as part of the evidence-based enforcement process and shall be updated annually.

SECTION 12. Funding. The Department shall allocate funds for the operationalization of this Order.

SECTION 13. Separability Clause. If any provision of this Order shall be held invalid or unconstitutional, the other portions or provisions hereof which are not affected shall continue in full force and effect.

SECTION 14. Repealing Clause. All Orders and other similar issuances inconsistent herewith are hereby revoked, amended, or modified accordingly.

SECTION 15. Effectivity. This Order shall take effect fifteen (15) days after its publication in a newspaper of general circulation and upon filing of three (3) certified copies hereof with the Office of the National Administrative Register (ONAR) and UP Law Center.

MARIA ANTONIA YULO LOYZAGA
Secretary

Publication: Manila Standard
June 11, 2025

Acknowledgement: ONAR, U.P. Law Center
June 13, 2025



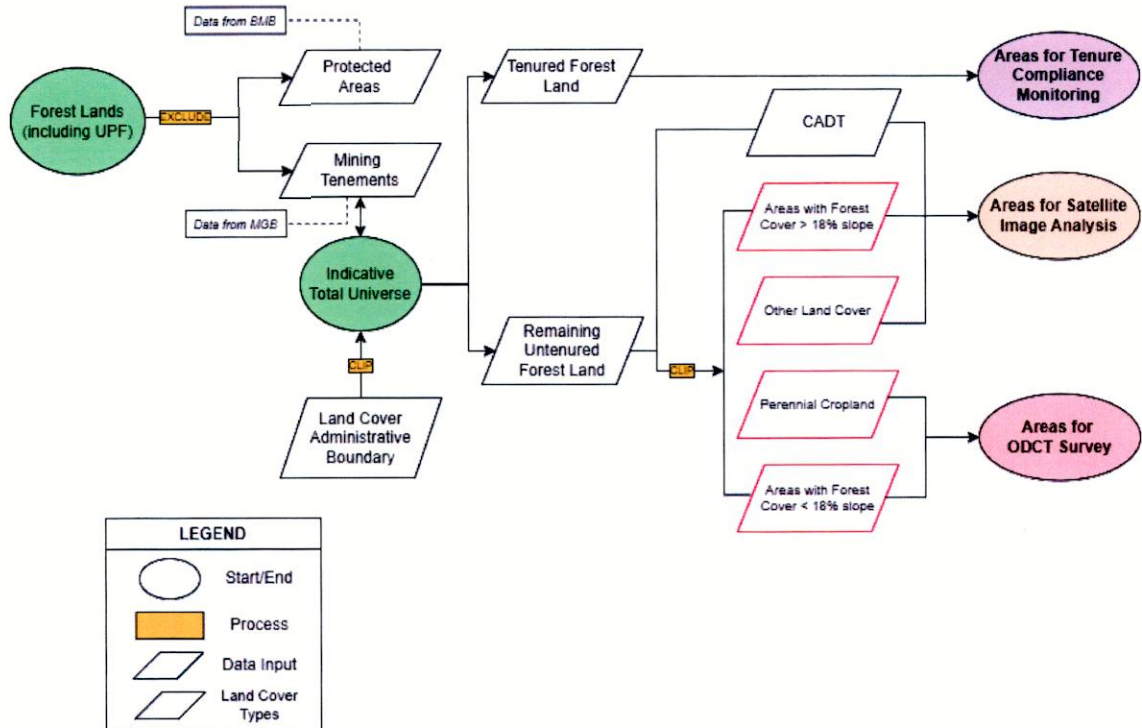
REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF ENVIRONMENT
AND NATURAL RESOURCES



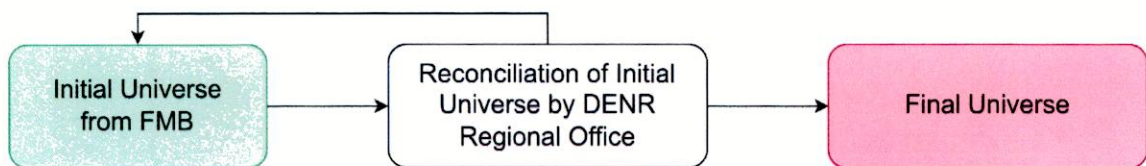
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Annex 1. Processing of Universe and Development of Survey Tool

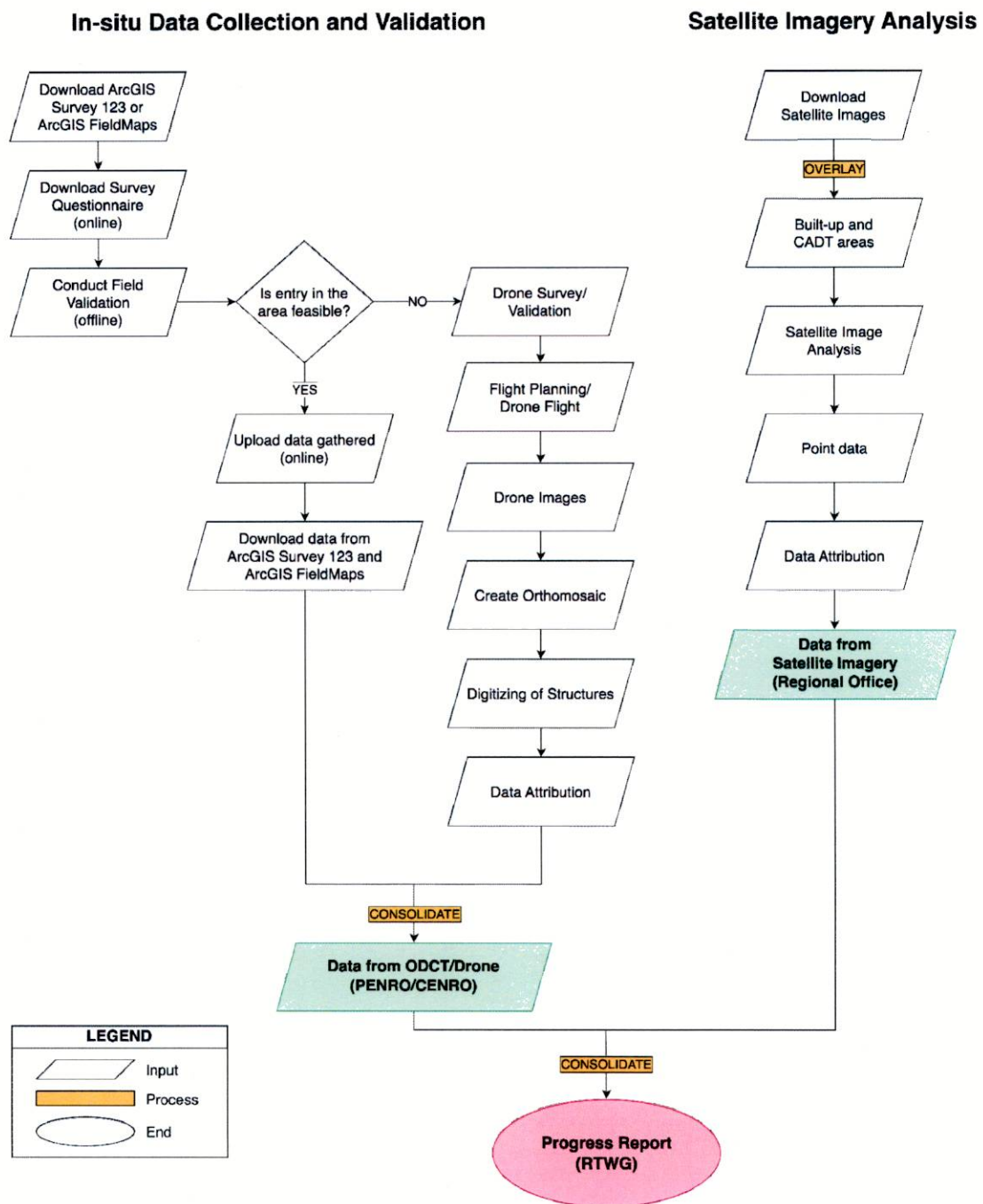
1.1 Processing of Indicative Universe



1.2 Derivation of Final Universe



1.3 Process Flow in In-Situ Data Collection and Validation and Satellite Imagery Analysis

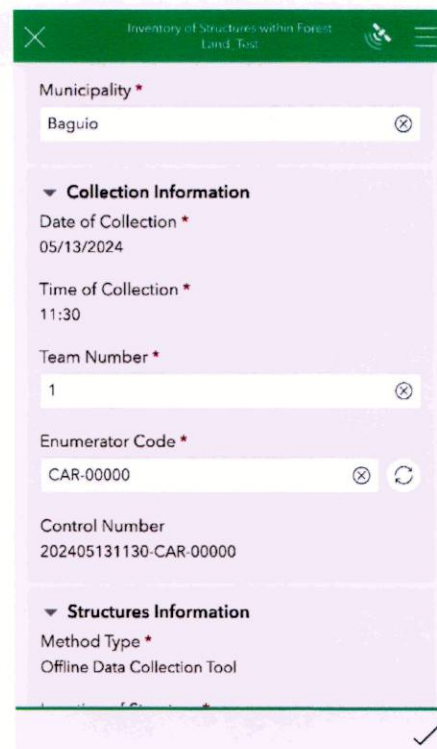


Annex 2. Offline Data Collection Tool (ArcGIS Survey123)

2.a. ArcGIS Survey123 Interface



2.b. Smartform

The image shows a Smartform interface for "Inventory of Structures within Forest Land, Test". It displays a map with a location pin and coordinates "14°39'N 121°3'E ± 36.0 m". A warning message states "Position accuracy does not meet threshold of 10 m". Below the map, there are dropdown menus for "DENR Jurisdiction" with fields for "REGION" (CAR), "PENRO" (Benguet), "CENRO" (Baguio), "District" (II), and "Municipality" (Baguio). A checkmark is at the bottom right.The image shows a Smartform interface for "Inventory of Structures within Forest Land, Test". It contains fields for "Municipality" (Baguio), "Collection Information" (Date of Collection: 05/13/2024, Time of Collection: 11:30, Team Number: 1, Enumerator Code: CAR-00000), and "Control Number" (202405131130-CAR-00000). There is also a section for "Structures Information" with "Method Type" (Offline Data Collection Tool). A checkmark is at the bottom right.

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Inventory of Structures within Forest
Land_Test

▼ Structures Information

Method Type *
Offline Data Collection Tool

Location of Structure *
Please select the category of the location based on the provided boundary.
Forest lands with forest cover and 0-18% slope

Type of Structure *
Mine shaft

Estimated Area *
Square Meters (If not applicable = 0)

Estimated Vertical Height *
Meters (If not applicable = 0)

Number of Floors *
(If not applicable = 0)

Material used in the construction of the Structure *

Inventory of Structures within Forest
Land_Test

Material used in the construction of the Structure *
Bamboo

Use of Structure *
Commercial

Classification of Structure *
Permanent

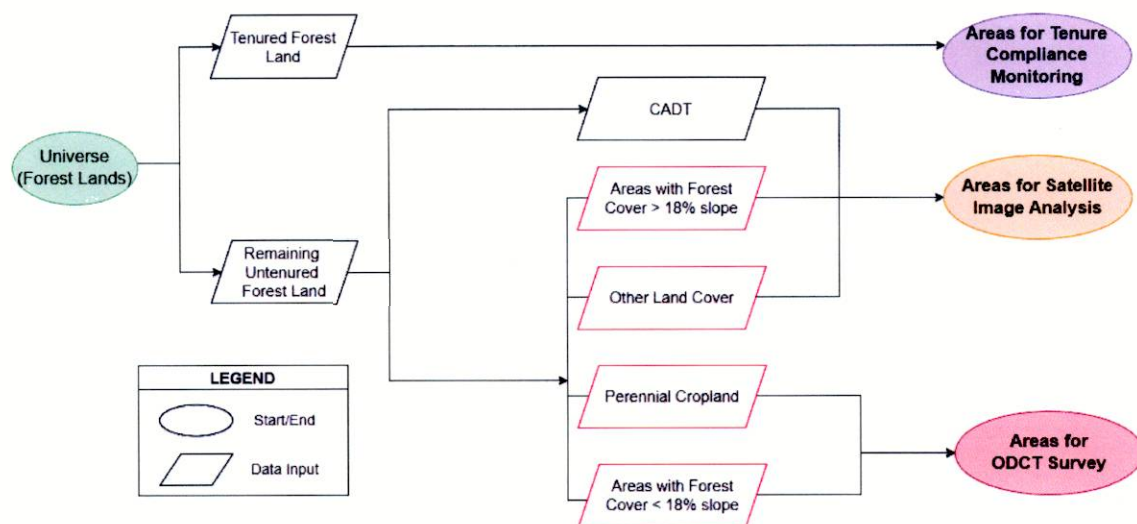
Contact Person *
Name of Owner (First Name, Middle Initial, Last Name)
Juan A. Dela Cruz

Image *
Image/Photo of the structure

Remarks

Material used in the construction of the Structure *

Annex 3. Methodology to be used



Annex 4. Data Attribution

The data attribution recommended below is included in the FSD Guidebook. All information shall be provided for structures within forest lands gathered using the ArcGIS Survey123 (Table 1) and Tenure Compliance Monitoring (Table 2). For data on structures gathered from satellite imagery only applicable attributes in Table 1 shall be provided.

Table 1. Data attribution for Structures collected through Survey123 and Satellite Image

FIELD NAME	TYPE	FIELD LENGTH	DESCRIPTION
REGION	Text	10	Name of Regional Jurisdiction
PENRO	Long Integer		Name of PENRO Jurisdiction
CENRO	Text	50	Name of CENRO Jurisdiction
DISTRICT	Text	10	Name of Congressional District
MUN_CITY	Text	100	Name of Municipality or City
PSGC	Text	10	Philippine standard geographic code of the municipality
TEAM_NO	Text	4	Team Number
ENU_CODE	Text	100	Enumerator Code
LOC_STRUC	Text	50	Refers to the location of Structures provided in Section 5.1 of the DAO
STRUCT_TYP	Text	100	Refers to the type of structures found in the area
YEAR_CONST	Short Integer	5	Refers to the year of construction.
NO_FLOORS	Text	5	Vertical height of the structure in terms of building
AREA_SQM	Text	50	Estimated area of the structure in square meters
MAT_USED	Text	100	Refers to the type of materials used in the construction of the structure
USE_STRUC	Text	50	Refers to the use of the structure
NORTHINGS	Double		Y Coordinates based on PRS 1992 UTM Zone 51 N
EASTINGS	Double		X Coordinates based on PRS 1992 UTM Zone 51 N
CLASS_STRU	Text	100	Refers to whether the identified structure is permanent or temporary
CONT_PERS	Text	50	Refers to the name of the owner or contact person of structure if available
BASE_OCCU	Text	255	Basis of occupation (transfer certificate of title, tax declaration, business permit, others)
LC_NO	Text	100	Refers to the land classification map number covering the area
FAO_NO	Text	100	Refers to the Forestry Administrative Order No. of the land classification map
METHOD	Text	50	Methodology used in identifying structures
REMARKS	Text	255	Description of the area or other relevant information

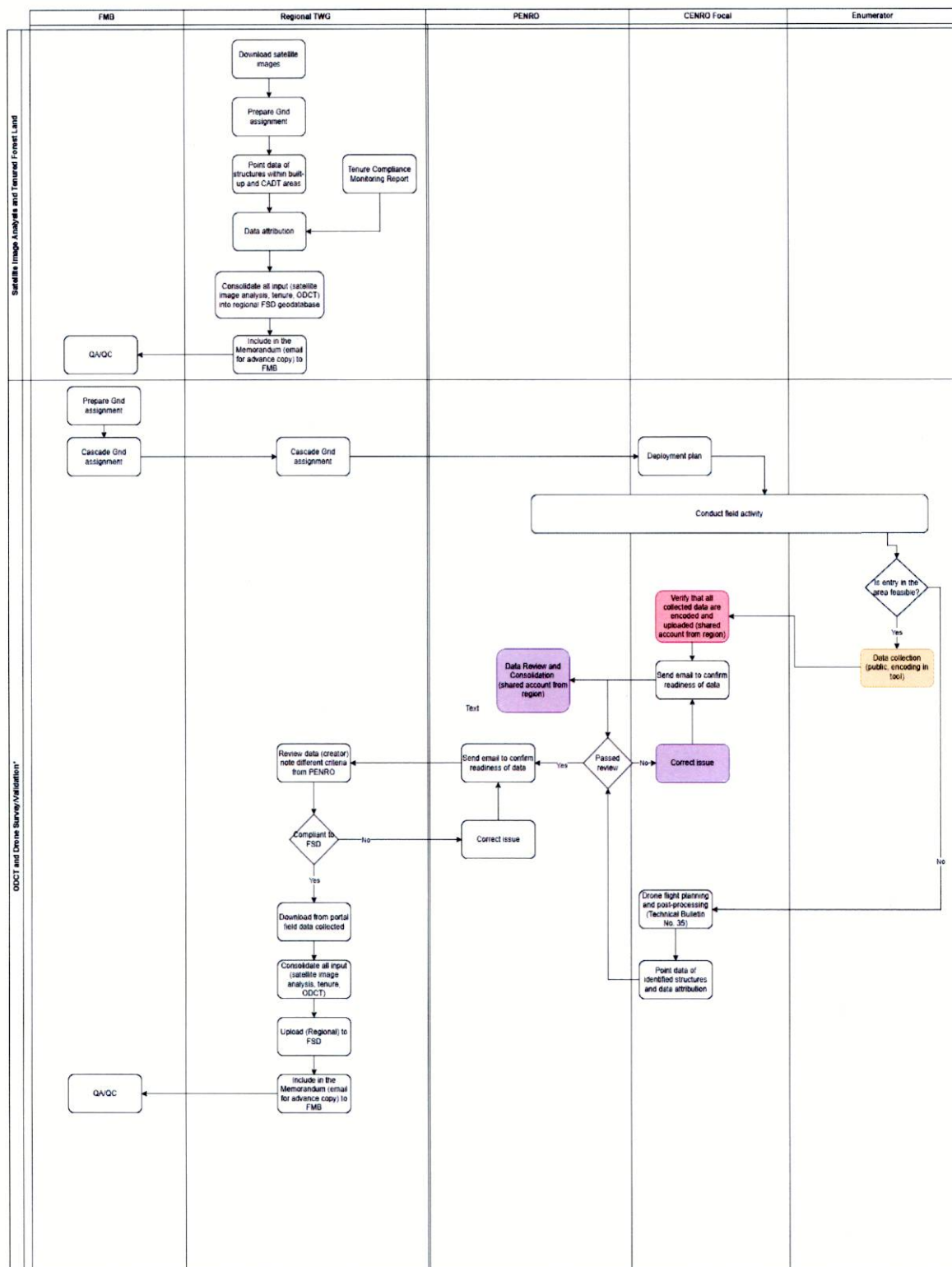
DAO RE: GUIDELINES ON THE INVENTORY OF STRUCTURES WITHIN FOREST LANDS

For Tenured forest lands, structures with geographical locations as specified in the compliance monitoring reports vis-a-vis their CDMP shall be submitted with complete attribution as shown below:

Table 2. Data attribution for Tenure Datasets

FIELD NAME	TYPE	FIELD LENGTH	DESCRIPTION
REGION	Text	10	Name of Regional Jurisdiction
PENRO	Long Integer		Name of PENRO Jurisdiction
CENRO	Text	50	Name of CENRO Jurisdiction
DISTRICT	Text	10	Name of Congressional District
MUN_CITY	Text	100	Name of Municipality or City
PSGC	Text	10	Philippine standard geographic code of the municipality
NAME_ENU	Text	100	Name of the Monitoring Officer
LOC_STRUC	Text	50	Refers to the location of Structures provided in Section 5.1 of the DAO
TENURE	Text	50	Type of Tenure Instrument
TEN_NO	Tetx	25	Refers to Agreement control number (official control number given by Region)
STRUCT_TYP	Text	100	Refers to the type of structures found in the area
YEAR_CONST	Short Integer	5	Refers to the year of construction.
NO_FLOORS	Text	5	Refers to the vertical height of the structure in terms of building
AREA_SQM	Text	50	Refers to estimated area of the structure in square meters
MAT_USED	Text	100	Refers to the materials used in the construction of the structure
USE_STRUC	Text	50	Refers to the use of the structure
NORTHINGS	Double		Y Coordinates based on PRS 1992 UTM Zone 51 N
EASTINGS	Double		X Coordinates based on PRS 1992 UTM Zone 51 N
CLASS_STRU	Text	100	Refers to whether the identified structure is permanent or temporary
CONT_PERS	Text	50	Refers to the Name of Tenure Holder
LC_NO	Text	100	Refers to the land classification map number covering the area
FAO_NO	Text	100	Refers to the Forestry Administrative Order No. of the land classification map
METHOD	Text	50	Methodology used in identifying structures
REMARKS	Text	255	Description of the area or other relevant information

Annex 5. Process of data submission



*If entry in the area is not feasible

Annex 6. Template Format of Interim Progress Report (to be submitted to the RED on a monthly basis)

MEMORANDUM

FOR : The Regional Executive Director

THRU : The Assistant Regional Director for Technical Services
The Chief, Surveys and Mapping Division

FROM : The PENR Officer
PENRO _____

SUBJECT : **INTERIM PROGRESS REPORT OF THE CONDUCT OF INVENTORY OF STRUCTURES WITHIN FOREST LANDS FOR THE MONTH OF _____ WITHIN THE MUNICIPALITY OF _____, PROVINCE OF _____**

DOCUMENT/S ATTACHED : 1. MOV for the uploading of geospatial data on structures with complete attribute information; and
2. Other supporting documents

DATE :

I. Introduction

- Brief overview and description of the area
- Total extent of forest lands
- other relevant information

II. Inventory Status

Location	CENRO/ Implementing PENRO	Indicative Target Area ² (in hectares)	Total Area Covered (in hectares)	Percent Accomplishment (%)	Equivalent No. of Grids (No)	No. of Structures identified (No)	Remarks
Maragondon, Cavite	Cavite	1000	20	2%	20	65	
Ternate, Cavite	Cavite	300	10		10	15	On-going

Note: Area in hectares shall be calculated using WGS 1984 UTM Zone 51 N

² Total target area of CENRO

III. Issues and Challenges

This shall include issues/concerns encountered during the conduct of the activity with the corresponding actions taken.

Issues and Challenges	Mitigation Actions Implemented
Entry in the area is not feasible	UAV survey conducted; Forwarded to RTWG for Satellite Imagery Analysis
Illegal occupancy within Barangay _____, Municipality of _____, Province of _____	Conducted Information, Education, and Communication Campaign; Referred to the Monitoring and Enforcement Section for hearing and further deliberation

IV. Recommendations and Next Steps

This shall provide proposed activities/programs/projects for the structures inventoried. This shall also include justification in areas which entry is not feasible or UAV survey is not possible.

Detailed plan for the next reporting.

V. Appendices

Additional data, charts, or maps as needed.

For your information, consideration and further instruction/s.

PENR Officer

Annex 7. Template Format of Progress Report (to be submitted to FMB Director on a semi-annual basis)

MEMORANDUM

FOR : The Director
Forest Management Bureau

FROM : The Regional Executive Director
DENR Region ____

SUBJECT : **PROGRESS REPORT OF THE CONDUCT OF INVENTORY FOR THE PERIOD OF JANUARY - JUNE, 20XX WITHIN REGION ____**

DOCUMENT/S
ATTACHED :

DATE :

I. Introduction/ Background

This shall provide information and an overview of the activities conducted in the implementation of the activity.

II. Statistical Report

A. Physical Target vs. Accomplishment

This shall include province-wide accomplishments. As a reminder, if the survey for a particular province is still ongoing at the time of reporting, the report shall include the percentage of accomplishment and target completion in writing and there is no need to submit incomplete data yet.

Table 1. Physical Accomplishment per Office

Office/ Activity	1st Quarter			2nd Quarter			Remarks/ Justification ³
	Target	Accomplishment	% Accom	Target	Accomplishment	% Accom	
TOTAL (REGION)							
Satellite Image							
ODCT							

³ Justification for unaccomplished target

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Office/ Activity	1st Quarter			2nd Quarter			Remarks/ Justification ³
	Target	Accomplishment	% Accom	Target	Accomplishment	% Accom	
PENRO xxx							
CENRO 1							
CENRO 2							

Table 2. Inventory of Structures within Tenure

Type of Tenure/ Name of PO	Area (in hectares)	No. of Structures			Remarks
		Based on CDMP	Based on Actual Inventory		
			Permanent	Temporary	
TOTAL					
1. Community-based Forest Management Agreement (CBFMA)					
People's Organization XXX					
People's Organization XXX					
2. Forest Land Use Agreement (FLAg, SPLULA, OLPLA)					
People's Organization XXX					
People's Organization XXX					

III. Analysis

Analysis of structures within forest lands in relation to population, land cover, and environmental impact.

- a. Distribution of structures (type of structures, density and spatial distribution within forest lands);*
- b. Relationship between population density and distribution of structures;*
- c. Forest and land cover changes ;**
- d. Environmental impact - the extent of deforestation and forest degradation due to the presence of structures; and*
- e. Others*

IV. Budget Utilization

Office	Allotment ('000)	Obligation ('000)	Disbursement ('000)	Percent Utilization (%)
REGION	1,000	500	400	80%
PENRO/ CENRO	XXX	XXX	XXX	XX
Batangas	XXX	XXX	XXX	XX
Calaca				
Lipa				

V. Issues and Challenges

This shall include issues/concerns encountered during the conduct of activity corresponding with the actions taken.

Table 3. Issues and Concerns

Issues/Challenges	Mitigation Actions Implemented

VI. Recommendation and Next Steps

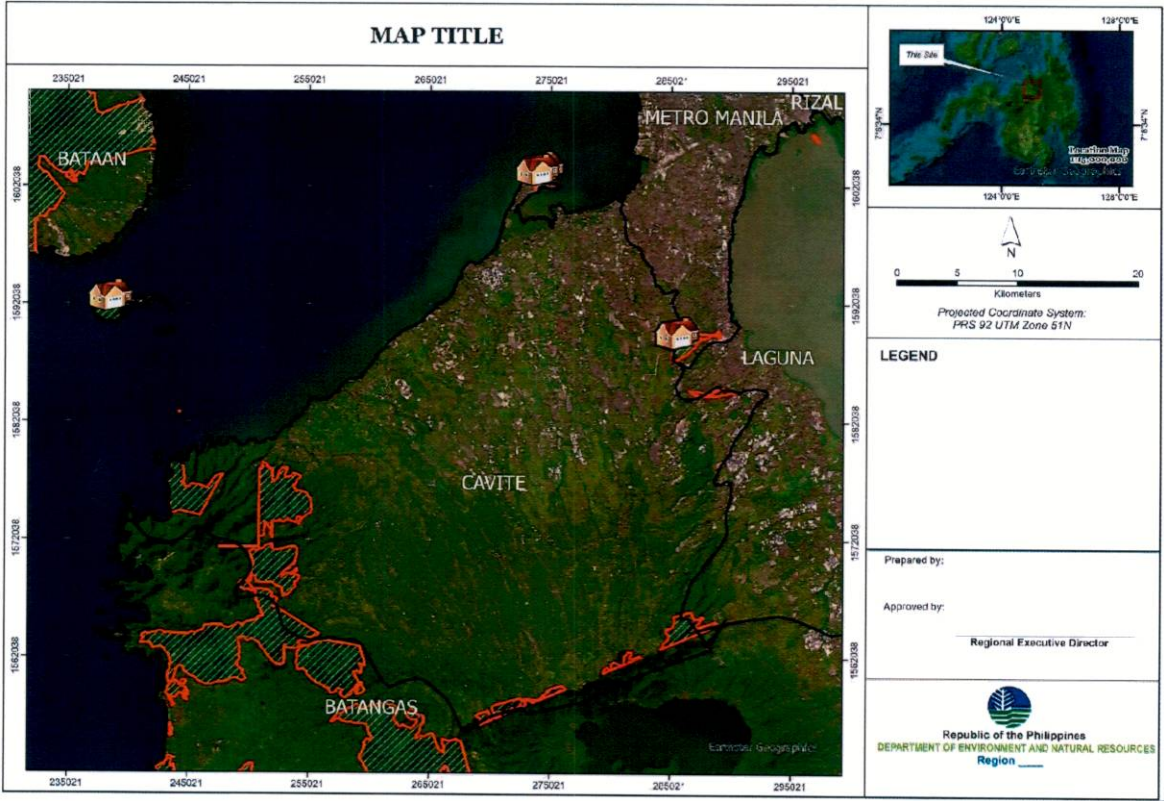
This section shall provide policy, program, and project recommendations regarding the inventory of structures.

This shall include categorical recommendations relative to the course of actions to be conducted to resolve the current situation of the Region regarding the inventoried structures. Illegal structures within forest lands should be prosecuted through Section 78 of PD No. 705, while illegal or irregularly issued titles within forest lands should be prosecuted through cancellation and reversion complaints.

VII. Attachments

1. Shapefiles with complete attributes (Google Drive etc.).
2. Photo Documentation of the conduct of the activity.
3. Signed Maps per province per boundary (digital copy).

DAO RE: GUIDELINES ON THE INVENTORY OF STRUCTURES WITHIN FOREST LANDS



Annex 8. Template Format for the Final Report

The final report is the activity completion report which shall contain the three-year accomplishment of the DENR Regional and Field Offices using geospatial technologies in the conduct of inventory of structures within forest lands.

MEMORANDUM

FOR : The Director
Forest Management Bureau

FROM : The Regional Executive Director
DENR Region ____

SUBJECT : **FINAL REPORT IN THE CONDUCT OF INVENTORY OF STRUCTURES WITHIN FOREST LANDS IN REGION ____ FOR FY 20XX - 20XX**

DOCUMENT/S
ATTACHED :

DATE :

I. Executive Summary

This shall provide an overview of the physical and financial accomplishments of the conduct of the activity.

II. Physical and Financial Report per year per province

(Target vs. Accomplishment)

(Include justification for unaccomplished target)

Table __. Physical and Financial Statistical Report per Province

Region/ Office	Universe	Year 1		Year 2		Year 3	
		Target	Accomp	Target	Accomp	Target	Accomp
Region							
PENRO							
CENRO							

III. Complete Staff Work (*Rationale, Legal Basis, etc*)

This section shall provide the chronological order of activities conducted in the implementation of the activity.

IV. Analysis

Summary of analysis of structures within forest lands in relation to population, land cover, and environmental impact.

- a. Distribution of structures (type of structures, density, and spatial distribution within forest lands)*
- b. Relationship between population density and distribution of structures*
- c. Forest and land cover changes*
- d. Environmental impact - the extent of deforestation and forest degradation due to the presence of structures*
- E. Projection on the progress of structures through time*

V. Issues and Challenges

Issues and Challenges	Mitigation Action Implemented

VI. Recommendations and Next Steps

This section shall provide policy, program, and project recommendations regarding the inventory of structures.

This shall include categorical recommendations relative to the course of actions to be conducted to resolve the current situation of the Region regarding the inventoried structures. Illegal structures within forest lands should be prosecuted through Section 78 of PD No. 705, while illegal or irregularly issued titles within forest lands should be prosecuted through cancellation and reversion complaints.

VII. Attachments

1. Regional Special Order re: Creation and Composition of Regional Technical Working Group and Ground Validation Team;
2. Photo Documentation of the conduct of the activity;
3. Shapefiles with complete attributes (FSD Portal, Google Drive etc.)
 - *Structures collected through ODCT shall provide all the information in the data attribution while structures digitized in satellite imagery shall only include applicable attributes. For information that can not be determined in the satellite imagery, NA ("Not Applicable") shall be inputted.*

DAO RE: GUIDELINES ON THE INVENTORY OF STRUCTURES WITHIN FOREST LANDS

- *For Tenure Datasets, structures with geographical locations shall be submitted with complete attributes.*
4. Excel file/ CSV file; and
 5. Signed Maps (digital copy)