Geospatial Monitoring & Evaluation System for National Authority CAMPA

Chapter: I (Mandatory Activities)

1) Database Preparation and Geospatial Mapping of Mandatory Activities Under Compensatory Afforestation Fund (CAF) Act, 2016

1. Introduction

As per the provisions of the Compensatory Afforestation Fund (CAF) Act, 2016, it is mandatory to monitor the CAMPA activities (Compensatory Afforestation (CA), Additional Compensatory Afforestation (ACA), Penal Compensatory Afforestation (PCA), Catchment Area Treatment (CAT) Plan, Integrated Wildlife Management Plan (IWMP), and other site-specific activities.

This report presents a **comprehensive technical action plan** for the effective implementation of spatial Monitoring and Evaluation (M&E) of CAMPA works and activities executed in all State/UTs through the utilization of Compensatory Afforestation Fund (CAF) resources.

The comprehensive technical action plan indicates: -

1. **State/UTs wise KML file database preparation**
2. **Satellite imagery integration (preferably biannual LISS IV 5.8m resolution imagery and ESRI Basemap)**
3. **Development of Web Portal & Dashboard using ArcGIS Pro Advanced and ArcGIS Enterprise**
4. **Vegetation, Forest fire & Moisture indices (NDVI, EVI, SMI) formulation and integration.**
5. **It is also intended to use the Forest type classification zoning for the generation of these indices and its integration.**
6. **Attribute based monitoring (Financial Year, State, District, Division etc.)**
7. **Satellite image analysis using machine learning to detect plantation health and canopy growth.**
8. **Time-series analysis of remote sensing data to track canopy change percentages.**
9. **Automated alerts for plantation degradation zones.**
10. **Any other feature which could be added in future.**

The system will ensure transparency, scientific monitoring, and decision support at State and National levels.

2. Database Preparation (ArcGIS Pro Advanced)

2.1 KML Data Standardization

Step 1: Import KML

a. Use KML To Layer tool in ArcGIS Pro.
b. Convert into File Geodatabase (.gdb).
c. Reproject into standard coordinate system (WGS 84 / UTM Zone as applicable).

Step 2: Geometry Validation

1) Check topology errors:
    a. Overlaps
    b. Gaps

c. Multipart polygons
d. Any other errors

2) Repair geometry using “Repair Geometry Tool”.

Step 3: Attribute Structure Design w.r.t Annual Plan of Operation

Create standardized fields:

Field Name	Data Type	Description
Activity	Text	1. Activities as per Section 6(a) of CAF Act, 2016 2. Activities as per Rule 5(2) of CAF Rules, 2018 3. Activities as per Rule 5(3) of CAF Rules, 2018
Proposal_No.	Text	Same as FC Proposal in case of Mandatory Activities
Sub_ Activity	Text	1. CA, ACA, PCA, CAT Plan, IWMP, Others 2. 5(2)a to 5(2)m 3. 5(3)a to 5(3)k
Financial_Year	Short Integer	Source-Level Verification
State_Name	Text	Source-Level Verification
District	Text	Source-Level Verification
Division	Text	Source-Level Verification
Range	Text	Source-Level Verification
Land_Type (NFL, DFL, FL)	Text	Source-Level Verification
Work_Type	Text	As aligned in Digital APO
Sub_Work_Type	Text	As aligned in Digital APO
Plantation/Implementation Year	Short Integer	Source-Level Verification
Physical_Target	Double	Source-Level Verification
Financial_Target	Double	Source-Level Verification
Remarks	Text	Any Observation

2.2 Enterprise Geodatabase Creation

a. Open ArcGIS Enterprise Geodatabase (PostgreSQL / SQL Server).
b. Create feature datasets:
   I. CAMPA Activities (CA, ACA, PCA, (CAT) Plan, IWMP)
   II. Indices
   III. Forest Type
   IV. Administrative Boundaries and Demarcation and digitisation of forest boundary etc.

3. Satellite Imagery Integration (Biannual)

3.1 Data Integration

1. Satellite imagery (biannual):

a. Pre-Monsoon (April–May)
b. Post-Monsoon (October–November)

2. Datasets:
   a. High Resolution ESRI Base Map
   b. LISS-IV (5.8m for vegetation indices)
   c. Sentinel-1&2
   d. Landsat-5,7,8-9 (30 m spatial resolution data to support legacy monitoring from 1980 onwards.)

3.2 Vegetation & Moisture Indices Generation/ Integration

1) NDVI (Normalized Difference Vegetation Index)

1. Formula:

$$NDVI = (NIR - Red)/(NIR + Red)$$

2. Purpose:
   a. Plantation survival monitoring
   b. Vegetation density

2) EVI (Enhanced Vegetation Index)

1. Formula:

$$EVI = 2.5 \times (NIR - Red)/(NIR + 6Red - 7.5Blue + 1)$$

2. Purpose:
   a. Dense forest canopy monitoring
   b. Reduced atmospheric effect

3) SMI (Soil Moisture Index)

1. Derived from SWIR & NIR bands and SAR Data.
2. Purpose:
   a. Soil moisture stress detection
   b. Drought impact assessment

3.4 Classification

1. Reclassify indices into:
   a. Very Low
   b. Low
   c. Moderate
   d. High
   e. Very High
2. Perform zonal statistics:
   a. State/UTs Wise
   b. Division-wise
   c. Year-wise

4. Forest Type Zoning Integration

4.1 Forest Type Data

1. Integrate forest type classification based on:
   a. Champion & Seth Classification (1968)

4.2 Overlay Analysis

1. Perform:
    a. Intersect CAMPA Activities areas with forest types
    b. Generate forest-type-wise plantation performance
    c. Identify degraded forest zones

5. Publishing Layers to ArcGIS Enterprise

5.1 Publish Services

1. From ArcGIS Pro:
    a. Publish Feature Layer (CAMPA Activities)
    b. Publish Image Services (Indices)
2. Enable:
    a. Query
    b. Editing (restricted to admin)
    c. Time-enabled layers

6. Portal Development

Web GIS Portal Structure

1. **Modules:**
    a. CAMPA Activity Viewer
    b. Biannual Monitoring Module
    c. Forest Type Analysis Module
    d. Jurisdictional Report (National, State, Regional, District/Division) Generation Module
    e. Demarcation and digitisation of forest boundary
    f. Field verification via Mobile Application
2. **Layer Structure in Portal**
    1) Base Layers:
        a. High resolution ESRI base imagery
        b. Land Use Land Cover imagery
        c. Google Street View
        d. PF/RF Boundary
        e. Administrative boundaries
        f. Any other relevant spatial dataset
    2) Operational Layers:
        a. CAMPA Activity Layer
        b. NDVI (Time-enabled)
        c. EVI
        d. SMI
        e. Forest Type Zones
        f. Forest Fire data
        g. Man-Wildlife conflict hotspot

7. Dashboard Development

1) **Dashboard Components:**
    a. Interactive Map View (Landing Page)

1. Indicator Cards:
    a. Total Area (Ha)
    b. Canopy Improvement Percentage
    c. Avg NDVI
2. Pie Chart:
    a. Forest Type Distribution
3. Bar Graph:
    a. Division-wise Performance
4. Time Slider:
    a. Biannual comparison
5. Data Filters:
    a. Financial Year
    b. State
    c. District
    d. Division
    e. Activity Type

8. Monitoring Framework

8.1 Performance Indicators

Indicator	Purpose
NDVI Change (%)	Vegetation growth
EVI Trend	Canopy improvement
SMI Trend	Soil moisture
Forest Type Impact	Ecological suitability

8.2 Alert Mechanism

1. Set thresholds:
    a. NDVI < 0.2 → Poor vegetation growth (https://science.nasa.gov/)
    b. SMI < Threshold → Moisture stress
    c. Decreasing trend 2 consecutive seasons → Alert

9. Reporting System

1. Auto-generated Reports:
    a. State/UTs -wise CAMPA Activities and canopy improvement status
    b. Division-wise CA and canopy improvement status
    c. Year-wise plantation growth
    d. Forest-type-wise canopy improvement status
    e. Division Wise comparison reports
2. Export formats:
    a. PDF
    b. Excel
    c. Web reports

10. Expected Outcomes

1. Transparent monitoring of CAMPA activities
2. Scientific tracking of vegetation growth
3. Forest type-based ecological evaluation
4. Financial year-wise performance analysis
5. Centralized monitoring platform
6. Real-time M&E dashboard

Status of Compensatory Afforestation since 1980 till 31st March, 2025

(Area in Ha)

S. No.	State/UT	Forest Area Diverted under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 (as on 31.03.2025)	Proposed/mandated CA to be carried out since 1980 till 31.03.2025	CA carried out/Achieved since 1980 (as on 31.03.2025)	Balance CA/Backlog CA to be carried out since 1980 (as on 31.03.2025)	Date of received
1	**Andaman & Nicobar Islands**	2744.67	2695.17	649.99	2045.18	28.01.2026
2	**Andhra Pradesh**	28647.65	42723.20	37370.20	5353.08	03.02.2026
3	**Arunachal Pradesh**	31764.93	61209.53	42415.16	18794.37	30.01.2026
4	**Assam**	6244.83	10015.22	8588.01	1427.21	21.01.2026
5	**Bihar**	4844.44	7739.82	7245.22	494.61	21.01.2026
6	**Chandigarh**	64.14	110.20	110.20	0.00	30.01.2026
7	**Chhattisgarh**	43951.18	74065.84	64160.92	9904.92	21.01.2026
8	**Delhi**	322.42	407.93	340.46	96.16	03.02.2026
9	**Goa**	2362.87	3566.38	3189.81	376.58	29.01.2026
10	**Gujarat**	71626.61	103875.91	98529.63	5346.28	04.02.2026
11	**Haryana**	8861.65	16060.12	11890.64	4169.48	28.01.2026
12	**Himachal Pradesh**	15843.20	31731.55	29596.60	2135.00	21.01.2026
13	**Jammu & Kashmir**	11194.85	22389.70	26736.27	0.00	05.02.2026
14	**Jharkhand**	30682.93	74039.63	47802.36	26237.27	02.02.2026
15	**Karnataka**	31577.24	30292.74	28669.41	1623.33	21.01.2026
16	**Kerala**	38112.49	60830.53	60424.13	406.40	02.02.2026

S. No.	State/UT	Forest Area Diverted under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 (as on 31.03.2025)	Proposed/mandated CA to be carried out since 1980 till 31.03.2025	CA carried out/Achieved since 1980 (as on 31.03.2025)	Balance CA/Backlog CA to be carried out since 1980 (as on 31.03.2025)	Date of received
17	**Ladakh**	Nil	Nil	Nil	Nil	21.01.2026
18	**Madhya Pradesh**	287248.22	262123.15	246146.82	15976.33	19.01.2026
19	**Maharashtra**	78468.00	113702.46	103736.63	9965.83	04.02.2026
20	**Manipur**	5916.86	11590.47	6931.82	4658.65	21.01.2026
21	**Meghalaya**	1010.72	1406.96	1035.61	371.36	30.01.2026
22	**Mizoram**	11576.46	12054.23	11059.21	995.01	23.01.2026
23	**Odisha**	69490.00	98058.90	79264.70	18794.20	
24	**Punjab**	13173.09	24332.07	23335.15	996.92	03.02.2026
25	**Rajasthan**	38894.76	53508.00	41455.60	12052.39	02.02.2026
26	**Sikkim**	3541.23	5789.88	5589.06	200.82	30.01.2026
27	**Tamil Nadu**	5232.64	4225.56	3972.57	252.98	24.01.2026
28	**Telangana**	42168.62	36059.17	32310.75	3748.43	01.02.2026
29	**Tripura**	-	8541.09	8157.38	383.71	02.02.2026
30	**Uttar Pradesh**	49611.14	42699.82	34785.43	7914.39	03.02.2026
31	**Uttarakhand**	53265.55	59276.66	56212.60	3064.06	21.01.2026
32	**West Bengal**	3491.11	3407.17	3204.45	202.72	21.01.2026
Total		**991934.50**	**1278529.05**	**1124916.79**	**157987.66**	

FY 2025-26 CA achievement (22 States/UTs) from 01.04.2025 till date: **97288.70 Ha**

Total CA achievement since 1980s till date = **1222205.49 Ha**

Chapter: II (NPV)

1) Database Preparation and Geospatial Mapping of Activities Supported under Rule 5(2) of Compensatory Afforestation Fund (CAF) Rules, 2018

1. Introduction

Sustainable forest management requires continuous regeneration and improvement of degraded forest areas through scientific forestry practices. Activities such as **Assisted Natural Regeneration (ANR)**, **Artificial Regeneration**, and **Silvicultural Operations** are important interventions aimed at restoring degraded forests, improving forest density, and enhancing ecological productivity.

Under Rule 5(2) of the Compensatory Afforestation Fund Rules, 2018, approval for the utilization of funds from the State/UT CAMPA accounts is accorded by the National Authority CAMPA to support strengthening forest conservation, ecological restoration, wildlife protection, and sustainable forest management.

In order to ensure effective monitoring, evaluation, and planning of these activities, it is to develop a **centralized geospatial database and GIS-based monitoring framework**. The system will integrate spatial and non-spatial data related to activities undertaken under Rule 5(2) and facilitate spatial tracking, monitoring of implementation progress, and assessment.

2. Objectives

The key objectives are as follows:

1. **To develop a centralized geospatial database** of **CAMPA-supported activities** under Rule 5(2).
2. **To enable spatial monitoring of forest restoration, conservation, and wildlife management activities.**
3. **To enable monitoring of activity** using remote sensing and GIS technologies.
4. **To strengthen monitoring and evaluation mechanisms** for all activity under Rule 5(2) of CAF Rule, 2018.
5. **To facilitate evidence-based planning and decision-making** for forest and wildlife conservation.

3. Structure of the work

1. The geospatial database will capture spatial and attribute information related to activities carried out under 5(2) of CAF Rule 2018.

5 (2)	Component	Spatial Representation
a	Assisted Natural Regeneration Areas	Polygon
b	Artificial Regeneration	Polygon
c	Silvicultural Operations	Polygon
d	Protection of Forests and Plantations	Polygon / Line
e	Pest and Disease Control Areas	Polygon
f	Forest Fire Prevention Infrastructure	Polygon / Line
g	Soil and Moisture Conservation Works	Polygon / Line

h	Voluntary Relocation of Villages	Point / Polygon
i	Wildlife Habitat Improvement Areas	Polygon
j	Wildlife Corridor Plantation	Polygon
k	Animal Rescue Centres / Veterinary Facilities	Point
l	Distribution of Wood-saving Devices in Forest Fringe Villages	Point
m	Biological Diversity Management Areas	Polygon

Note- *The spatial representation is indicative in nature and may be depicted as point, line, or polygon features, depending on the nature of the work and activity.*

2. Activity whose locations can be represented spatially will be mapped using Geographic Information System (GIS) tools. Depending on the nature of the work, the activity will be mapped as **points, lines, or polygons**.
3. **The database will store attribute information such as:**
    a. Activity Name
    b. State/ UTs, Forest Division and Range Name
    c. Protected area or wildlife corridor (if applicable)
    d. Area/length treated (in hectares)
    e. Year of treatment
    f. Species planted or regenerated
    g. Type of silvicultural intervention
    h. Any other relevant information related to aspects of activity

4. **Field Verification (Via Mobile Application)**

In addition to routine verification procedures, **random field verification of selected activity locations** will be undertaken periodically. A sample of activity sites from different States/UTs will be selected on a random basis for field inspection. The purpose of this exercise will be to validate the accuracy of geospatial data, confirm the existence and condition of works on the ground, and assess the quality and progress of implementation. The field observations, including geo-tagged photographs and GPS coordinates, will be recorded and integrated into the centralized geospatial database to support monitoring and evaluation.

2) Database Preparation and Geospatial Mapping of Activities Supported under Rule 5(3) of Compensatory Afforestation Fund (CAF) Rules, 2018

The activities under 5(3) of Compensatory Afforestation Fund (CAF) Rules, 2018 primarily support **institutional strengthening**, **infrastructure development**, **capacity building**, **monitoring mechanisms**, and **technology integration** required for effective forest and wildlife management.

1. Activity whose locations can be represented spatially will be mapped using Geographic Information System (GIS) tools. Depending on the nature of the work, the activity will be mapped as **points, lines, or polygons**.

2. **The database will store attribute information such as:**
    a. Activity Name
    b. State/ UTs, Forest Division and Range Name
    c. Year of treatment
    d. Any other relevant information related to aspects of activity

3. **Field Verification (Via Mobile Application)**

In addition to routine verification procedures, **random field verification of selected activity locations** will be undertaken periodically. A sample of activity sites from different States/UTs will be selected on a random basis for field inspection. The purpose of this exercise will be to validate the accuracy of geospatial data, confirm the existence and condition of works on the ground, and assess the quality and progress of implementation. The field observations, including geo-tagged photographs and GPS coordinates, will be recorded and integrated into the centralized geospatial database to support monitoring and evaluation.

Chapter: III (Ongoing Schemes)

3) Database Preparation and Geospatial Mapping of Ongoing Schemes under National Authority CAMPA

1. Introduction

The National Authority CAMPA approve a wide range of forestry and environmental conservation schemes across the country. These initiatives broadly fall under four major heads, namely **Forestry and Wildlife Research, Afforestation Promotion Programmes, Wildlife Conservation and Management Programmes, and Forest Protection and Conservation**.

Effective monitoring and evaluation of these schemes require the establishment of a **centralized database and GIS-based monitoring system** that enables spatial tracking of project locations, assessment of implementation progress, and evaluation of outcomes.

In this context, it is to develop a **comprehensive database and mapping platform** integrating both spatial and non-spatial datasets related to all ongoing schemes implemented using CAMPA funds. The system will facilitate systematic monitoring, improve transparency, and support evidence-based decision-making for the effective management of CAMPA-funded schemes across States and Union Territories.

2. Objectives

The Monitoring and Evaluation (M&E) framework for schemes implemented under the National Authority CAMPA fund includes:

1. **To develop a centralized digital database** containing spatial and non-spatial information on all ongoing schemes implemented under CAMPA funds.
2. **To enable geospatial mapping of schemes and activities** whose locations can be spatially represented, thereby facilitating spatial tracking and monitoring of works.
3. **To establish a GIS-based monitoring platform** that integrates field data, satellite imagery, and geospatial datasets for effective assessment of scheme implementation.
4. **To support evidence-based decision-making** by providing timely and accurate information on the status, progress, and outcomes of CAMPA-funded activities.
5. **To enhance transparency and accountability** in the implementation of CAMPA schemes through standardized data collection, monitoring, and reporting mechanisms.
6. **To create a national-level geospatial repository** of CAMPA-funded works that can support long-term planning, policy formulation, and environmental assessment.

3. Structure of the work

1. All ongoing schemes implemented using CAMPA funds will be compiled in a standardized database structure. This will include details such as:
    a. Name of the scheme

b. State and District
c. Forest division and range
d. Year of implementation
e. Year of Completion
f. Area covered or number of units
g. Financial allocation and expenditure
h. Physical progress of works (Ongoing/Completed)
i. Any other relevant information

2. Schemes whose locations can be represented spatially will be mapped using Geographic Information System (GIS) tools. Depending on the nature of the work, the schemes will be mapped as **points, lines, or polygons**.
3. A **centralized geospatial database** will be developed to store all spatial and attribute data related to CAMPA schemes. The database will enable:
    a. Standardized data storage and management
    b. Integration of spatial and non-spatial datasets
    c. Efficient data retrieval and analysis
    d. Data sharing among authorized stakeholders
4. Data Validation and Quality Control
   To ensure reliability and accuracy of the database, appropriate **data validation and quality control procedures** will be implemented.
   These procedures will include:
    a. Verification of spatial data using satellite imagery.
    b. Cross-checking of data with official records and progress reports submitted by Implementing Agency and State/UT CAMPA authorities.
    c. Field verification using GPS-based surveys, where required.

5. Field Verification: (Via Mobile Application)

In addition to routine verification procedures, **random field verification of selected scheme locations** will be undertaken periodically. A sample of scheme sites from different States/UTs and scheme categories will be selected on a random basis for field inspection. The purpose of this exercise will be to validate the accuracy of geospatial data, confirm the existence and condition of works on the ground, and assess the quality and progress of implementation. The field observations, including geo-tagged photographs and GPS coordinates, will be recorded and integrated into the centralized geospatial database to support monitoring and evaluation.

Details of Ongoing Schemes as on date.

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
Indian Council of Forestry Research and Education (ICFRE)/Forest Research Institute (FRI)								
1	Strengthening Forestry Research for Ecological Sustainability and Productivity Enhancement	2019-20/ 2025-26	6	313.67	216.18	189.62	ICFRE	RT Division
2	Estimation of Economic Losses in Real Term Per Hectare Basis due to Forest Fire in Uttarakhand and Madhya Pradesh.	2020-21/March 2023	2	3.79	3.4	3.40	ICFRE	Forest Protection Division
3	Preparation of DPR for Rejuvenation of Damodar and Subarnarekha rivers through forestry Inventions.	2021-2022 /September 2024	2	1.17	1.05	1.05	ICFRE	NAEB
4	Mapping monitoring and management of *Lantana camara* through utilization for improving livelihood of people in forest fringe villages of India.	2023-24	5	14.49	14.49	0.41	ICFRE	RT Division
5	Rehabilitation and Retrofitting of FRI Heritage Building	2023-24	1 year	10.35	10.35	10.35	ICFRE-FRI	RT Division
6	Modernization of National	2023-24	1.5 year	0.98	0.98	0.93	ICFRE-FRI	RT Division

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	Forest Insect Collection (NFIC) of FRI, Dehradun							
7	**Establishment of Programme Unit for Operationalization of Green Credits Programme at ICFRE**	2023-24	3 years	10.00	6.28	2.33	ICFRE_FRI	HSM Division
8	Identification of superior Genotypes of *Olea ferruginea* (Royle) Bearing high oil content in North Western Himalayan Region and development of its Propagation and cultivation Techniques	2024-25	4	0.4753	0.1178	0.0186	**ICFRE**	**RT**
9	Mass Timber based Building Construction: Capacity Building and Demonstration	2024-25	5	6.80	3.35	0.1598	**ICFRE**	**RT**
10	Promotion of Sandalwood cultivation through training programs across India to improve the economic status of farmers.	2024-25	5	8.58	0.15	0.0234	**ICFRE**	**RT**
11	National Collaborative Scheme on	2022-23	4	22.31	6.45	2.91	FRI	Forest Protection Division

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	Forest Fire Management							
12	Renovation & Modernization of Xylarium of Forest Research Institute.	2023-24	2	1.25	1.25	0.40 (as on 26.05.2025)	FRI	RT Division
13	Strengthening of National Forest Library and Information Centre for Education and Forestry Research-FRI	2023-24	1	1.63	1.63	1.43	FRI	RT Division
14	Study on regulation and management of cone induction and seed yield in Pinus gerardiana ex. D. Don	2024-25	4	0.57	0.25	-	ICFRE	RT Division
Wildlife Institute of India (WII)								
1	Endangered Species Recovery Programme (ESRP)-Development of Conservation plan for Gangetic River Dolphin	2015-16/ December 2025	5	23	21.37	20.88	WII	Wildlife Division
2	Conservation of Manipur's Brow Antlered Deer (Sangai)-ESRP	2015-16/ December 2025	5	19.95	10.31	8.39	WII	Wildlife Division
3	Recovery of Dugongs and their Habitats in India-ESRP	2015-16/ December 2025	5	23.58	18.37	16.47	WII	Wildlife Division
4	UNESCO Category2	2018-19/	3	18.66	18.66	16.45	WII	Wildlife Division

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	Centre (C2C) on Natural World Heritage Management and Training for the Asia-Pacific Region	March 2026						
5	PAN India assessment and monitoring of endangered species covered under the' Integrated Development of Wildlife Habitats (IDWH) scheme of MoEFCC Government of India	2021-2022/ March 2026	2	19.05	19.05	12.21	WII	Wildlife Division
6	Range-wide enumeration of River Dolphin populations in India	2021-22/ December 2025	1	10.15	10.15	10.15	WII	Wildlife Division
7	Phase II Proposal for Synchronized Elephant estimation.	2023-24	6 months	3.00	3.00	3.00	WII	NTCA
8	Part A Project Great Indian Bustard (Conservation Action Plan for GIB and Lesser Florican)	2024-25	5	50.96	20.11	5.41	**WII**	**WL Division**
9	Part B Indian Bustard (Conservation Action Plan for GIB and Lesser Florican)	2024-25	5	26.09	5.05	-	**WII**	**WL Division**
10	Genetic database of the rhino horn		2	0.4142	0.07	-	**WII**	**WL Division**

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	stockpile of Assam to curb poaching threat and assess temporal changes in genetic variation	2024-25						
11	Assessing Elephant Corridors, Habitat Utilization and Conflict Hotspots in the Bandhavgarh Region-WII	2025-26	3	0.97	0.58	-	**WII**	**Project Elephant Division**
12	Conducting Management Effectiveness Evaluation of Elephant Reserves in India"-WII	2025-26	1.6	2.29	0.57	-	**WII**	**Project Elephant Division**
13	Range wide Enumeration of River and Estuarine Dolphin Population in India"-WII	2025-26	2.6	12.43	5.18	-	**WII**	**WII**
14	Conservation and Management of the critically endangered gharial (Gavialis gangeticus)-WII	2025-26	5	45.15	14.10	-	**WII**	**WII**
15	Conservation and Management of Sloth Bear in India- A Landscape based initiative-WII	2025-26	5	13.67	2.68	-	**WII**	**WII**

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
16	Identifying effective wildlife management interventions for replication"-WII	2025-26	1.3	1.70	-	-	**WII**	**WII**
17	Establishment of National Centre of Excellence for Human Wildlife Conflict Management (NCCM) at SACON, Coimbatore as announced by the Hon'ble Prime Minister of India"-WII-	2025-26	5	99.54	11.64	-	**WII**	**WII**
Forest Survey of India (FSI)								
1	Monitoring Protocol for Plantations and Assets created by State Forest Departments (SFDs).	2019-20	6	13.14	2.90	1.30	FSI	SU Division
2	Satellite Survey of Encroachment position of Rejected claims as per Order of Hon'ble Supreme Court in Writ Petitions (civil) No(s) 109/2008 Wildlife First & Others vs. Ministry of Forest and	2021-2022	6	48.00	5.66	3.24	FSI	Forest Protection Division

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	Environment & others							
3	Strengthening of e-Green Watch	2023-24	5 years	6.32	Not released	-	FSI	SU Division
4	Web GIS based Decision Support System (DSS) for forest clearance.	2023-24	5 years	5.00	1.51	0.90	FSI	SU Division
5	Forest Fire Monitoring including burnt area assessment.	2023-24	5 years	9.01	Not released	-	FSI	SU Division
6	Above Ground Biomass (AGB) Estimation using Synthetic Aperture Radar (SAR) data	2023-24	5 years	2.88	0.05	Information awaited	FSI	SU Division
7	Completing the task of uploading and sharing of Recorded Forest Area (RFA) and other protected areas shapefiles with World Database on Protected Areas (WDPA)-FSI	2025-26	2 years	1.50	-	-	FSI	SU Division
Indian Institute of Forest Management (IIFM)								
1	Establishment of a centre of excellence for Forest Landscape Restoration	2023-24	1 year	2.86	Not released	-	IIFM	NAEB
2	Study on impact of Voluntary	2023-24	1 year	0.65	0.65	Information awaited	IIFM	RT Division

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	relocation of villages from Tiger Reserves							
3	Ecosystem Service Valuation Studies to be conducted in the Tiger Reserves of the country	2023-24	1 year	0.82	0.82	-	IIFM	NTCA
4	Developing Indian Institute of Forest Management (IIFM) Campus in Northeast and developing capacity strengthening of Forest Sector in India	2023-24	1	11.88	11.88	Information awaited	IIFM	RT
5	Establish a dedicated Cell of Scheme Operating Agency (SOA) to operate and manage the Indian Forest and Wood Certification Scheme (IFWCS)	2023-24	1	1.38	0.38	-	IIFM	RT
6	Ecosystem Services Valuation for Mangrove Ecosystems in India	2024-25	2	4.65	2.02	-	**IIFM**	**RT**
7	Building a Comprehensive Digital Repository of Important Environmental Conventions	2024-25	1	0.40	0.40	-	**IIFM**	**RT**

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	and their Conference of Party (COP) Deliberations.							
National Tiger Conservation Authority (NTCA)								
1	Assessment of Population Status of Tigers, Co-predators, Prey and their habitats in India	2022-23	1	21.60	21.60	21.60	NTCA	NTCA
2	Conservation breeding of Cheetah (*Acinonyx jubatus*) in Banni Grassland, Gujarat.	2023-24/ March 2026	2	20.31	14.70	9.95	**NTCA**	**NTCA**
3	Phase II Establishing Metapopulation of Cheetah	2024-25/ March 2027	1	57.30	26.20	-	**NTCA**	**NTCA**
4	Management of Tigers outside Tiger Reserves: A preventive strategy to deal with Man-Tiger conflict	2025-26	3	88.70	-	-	**NTCA**	**NTCA**
GIM/NAEB								
1	Nagar Van Yojana (620/1000 Nagar Van)	2020-21	5	895.00	522.27	-	SFDA	NAEB
2	School Nursery Yojana	2020-21	5	49.50	4.822	-	SFDA	NAEB
3	Mangrove Initiative for	2023-24	5 years	100.00	88.41	12.96	NAEB/GIM	NAEB/ GIM

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	Salt Pans Habitats and Tangible Incomes-MISHTI							
Bombay Natural History Society (BNHS)								
1	Implementing The Central Asian Flyway National Action Plan with Special Focus on Preparation of Site-Specific Activity Plan, Capacity Building, Developing Bird Sensitivity Map for Setting up of Wind Energy and Species Action Plans	2019-20/ March 2025	3	3.754	1.61	1.75 (As per the report received from BNHS)	BNHS	Wildlife Division
International Union for Conservation of Nature (IUCN)								
1	Enhanced Capacity Building of Stakeholders and State Government on Forest Landscape Restoration and Reporting Mechanism on Bonn Challenge.	2020-21/ October 2024	3.5	5.90	3.65	3.69 as per the PPT shared by IUCN.	IUCN	NAEB
Central Zoo Authority (CZA)								
1	Setting up National Referral Center for Wildlife Disease Monitoring and	2022-2025	5	3.00	2.08	2.08	CZA	Wildlife Division

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	Prevention-CZA							
2	Commissioning of National Referral Centre-Wildlife (NRC-W)	2024-25	2	76.50	5.00	-	**CZA**	Wildlife Division
Impact Assessment Division (IA Division)								
1	PARIVESH 2.0	2021-2022	5	95.59	63.10	31.76	Impact Assessment Division	Impact Assessment Division
NICSI								
1	Project proposal for the yearly maintenance, Up-gradation and FC module and Hand holding support of PARIVESH–NICSI	2016-17	-	5.96	6.81	6.81	NICSI	FC Division
Institute of Wood Science and Technology (IWST)								
1	Roll out and Preparedness of States for using National Transit Pass System.	2023-24	3	4.67	2.43	1.26	IWST, Bengaluru	Forest Policy Division
Karnataka State Authority								
1	Development of Sandalwood and Rosewood Estates and Management of Sandalwood Reserves in Karnataka	2022-23	7	25.65	0.48	0.42	Karnataka State Authority	-
Regional Offices Head Quarter (ROHQ)								
1	Proposal for seeking financial support for strengthening, monitoring and implementatio	2023-24	5 years	57.1162	8.07	0.28	DDGF of concerned Regional Offices	Regional Offices Headquarters (ROHQ) Division

S. No.	Scheme/Project Name	Starting Year/Extension	Project Period	Project cost	Fund released (Rs. in crore)	Fund utilized (Rs. in crore)	Implementing Agency	Programme Division
	n of the CAF Act by Regional Offices of the MoEFCC.							
	Total			**2286.1697**	**1151.3378**	**395.1518**		

Note: *The base geospatial layers, web portal, and monitoring dashboard developed for activities under Chapter I (Mandatory Activities) shall also be utilized for activities under Chapter II and Chapter III within the monitoring framework of the National Authority CAMPA.*

The same geospatial platform will function as a unified monitoring infrastructure, ensuring consistency in spatial data management, seamless integration of scheme-related information, and standardized visualization of activities across all chapters. Additional thematic layers corresponding to activities under Chapters II and III may be incorporated into the existing system as required, without altering the core architecture.

To maintain data integrity and confidentiality, all spatial and non-spatial data hosted on the platform shall be governed by strict data security protocols, including controlled access, role-based permissions, and secure data storage mechanisms. Data sharing, dissemination, or external access to any datasets or outputs generated through this platform shall ***not be permitted without prior approval of the Competent Authority of the National Authority CAMPA.***

Six Month Action Plan of Geospatial Monitoring & Evaluation System for National Authority CAMPA

April & May 2026: System Launch & Primary Data Development

The focus is on establishing the core technical infrastructure and completing the initial data development for all chapters.

1. **Infrastructure Establishment:** Build the centralized geospatial repository using ArcGIS Enterprise and develop the Web GIS Portal and real-time M&E Dashboard. *(To be executed by National Authority CAMPA)*
2. **Data Development (Chapter I):** Import and standardize State/UT KML data for mandatory activities, converting them to a standard WGS 84 / UTM coordinate system. *(To be executed by State/UTs CAMPA in supervision of National Authority CAMPA)*
3. **Data Development (Chapter II & III):** Design attribute structures and initiate mapping for NPV activities (Rule 5(2)/5(3)) and ongoing schemes as points, lines, or polygons. *(To be executed by State/UTs CAMPA in supervision of National Authority CAMPA)*
4. **Geometry Validation:** Perform rigorous topology checks to repair overlaps, gaps, and multipart polygon errors for all imported datasets. *(To be executed by State/UTs CAMPA in supervision of National Authority CAMPA)*
5. **Baseline Integration:** Integrate high-resolution ESRI Basemaps and LISS-IV 5.8m imagery and Sentinel-1&2 imagery to establish a pre-monitoring baseline. *(To be executed by National Authority CAMPA)*
6. **Thematic Indices Generation/Integration:** Operationalize automated NDVI, EVI, and SMI calculations to track vegetation density and moisture stress. *(To be executed by National Authority CAMPA)*
7. Any other feature that may enhance the functionality, efficiency, and usability of the geospatial monitoring portal and dashboard may be incorporated based on user requirements. *(To be executed by National Authority CAMPA)*

June 2026: National Expansion & Field Verification Module Deployment

1. **Continued Data Development (All Chapters):** *(To be executed by State/UTs CAMPA in supervision of National Authority CAMPA)*
    1) Chapter I: Expansion of KML mapping for all Compensatory Afforestation (CA) carried out since 1980.
    2) Chapter II: Mapping of point and line features for protection infrastructure and soil moisture conservation works.
    3) Chapter III: Continued mapping of schemes.
2. **Geographical Expansion:** Roll out the geospatial monitoring system to the first **10 States/UTs**, providing them with access to the web portal and monitoring dashboard. The system will enable users to visualize and analyse reports with respect to financial

year, forest division, range, activity type, and other relevant parameters, facilitating effective monitoring and evaluation of activities. *(To be executed by National Authority CAMPA)*

3. **Mobile App Rollout:** Deploy the Mobile Application for random field verification, enabling the capture of geo-tagged photos and GPS coordinates for ground-truthing. *(To be executed by National Authority CAMPA)*
4. **Quality Control:** Implement data validation procedures to cross-check spatial data with satellite imagery and official progress reports. *(To be executed by National Authority CAMPA)*
5. Any other feature that may enhance the functionality, efficiency, and usability of the geospatial monitoring portal and dashboard may be incorporated based on user requirements. *(To be executed by National Authority CAMPA)*

July 2026: Full National Coverage & Database Finalization

Completion of the expansion to all States/UTs and finalization of the comprehensive national repository.

1. **Full Expansion:** Complete the onboarding of all remaining States/UTs, ensuring a 100% unified national geospatial database for CAMPA activities. *(To be executed by National Authority CAMPA)*
2. **Continued Data Development:** Mapping for all activities till date under Chapters I, II, and III, ensuring every intervention is spatially represented. *(To be executed by State/UTs CAMPA in supervision of National Authority CAMPA)*
3. **Forest Type Zoning:** Integrate Champion & Seth (1968) forest classification to perform overlay analysis for ecological suitability assessments. *(To be executed by National Authority CAMPA)*
4. **Standardization Maintenance:** Perform an annual audit to ensure all attribute fields (e.g., Physical/Financial Targets, Plantation Year) are consistently populated. *(To be executed by National Authority CAMPA)*
5. **Baseline Finalization:** Finalize the 5-year baseline using biannual imagery (Pre-Monsoon and Post-Monsoon) for all States. *(To be executed by National Authority CAMPA)*
6. Any other feature that may enhance the functionality, efficiency, and usability of the geospatial monitoring portal and dashboard may be incorporated based on user requirements. *(To be executed by National Authority CAMPA)*

August 2026: Advanced Analytics & Predictive Monitoring

Transitioning from data collection to scientific evaluation and automated alerting.

1. **Data Development:** Complete mapping for all activities till date under Chapters I, II, and III, ensuring every intervention is spatially represented. *(To be executed by State/UTs CAMPA in supervision of National Authority CAMPA)*

2. **Machine Learning Integration:** Utilize machine learning for automated satellite image analysis to detect plantation density and canopy growth. *(To be executed by National Authority CAMPA)*
3. **Time-Series Analysis:** Conduct time-series tracking of remote sensing data to quantify canopy change percentages over the years. *(To be executed by National Authority CAMPA)*
4. **Alert Mechanism Activation:** Activation of automated threshold-based alerts (e.g., NDVI < 0.2) to identify degradation zones and moisture stress. *(To be executed by National Authority CAMPA)*
5. **Performance Comparison:** Generate State-wise comparison reports based on physical progress and average Vegetation Indices. *(To be executed by National Authority CAMPA)*
6. Any other feature that may enhance the functionality, efficiency, and usability of the geospatial monitoring portal and dashboard may be incorporated based on user requirements. *(To be executed by National Authority CAMPA)*

September 2026: Holistic Impact Assessment & Policy Support

1. **Impact Assessment:** Generate 5-year reports on canopy improvement status and year-wise plantation growth across all States/UTs. *(To be executed by National Authority CAMPA)*
2. **Evidence-Based Decision Support:** Use the centralized database to provide strategic decision support for future fund allocation and evidence-based planning. *(To be executed by National Authority CAMPA)*
3. **Reporting Automation:** Enable auto-generation of comprehensive jurisdictional reports in PDF, Excel, and Web formats for all stakeholders. *(To be executed by National Authority CAMPA)*
4. **National Repository Handover:** Finalize the national-level geospatial repository of CAMPA-funded works to support long-term environmental assessments. *(To be executed by National Authority CAMPA)*
5. **Unified Infrastructure Maintenance:** Ensure the common monitoring infrastructure continues to serve as the single source for all CAF Act/Rule activities. *(To be executed by National Authority CAMPA)*
6. Any other feature that may enhance the functionality, efficiency, and usability of the geospatial monitoring portal and dashboard may be incorporated based on user requirements. *(To be executed by National Authority CAMPA)*

Standard Operating Procedure (SOP)

For Data Development and Preparation by States/UTs

(Under Geospatial Monitoring & Evaluation System for CAMPA Activities)

1. Background

In accordance with the provisions of the Compensatory Afforestation Fund (CAF) Act, 2016 and CAF Rules, 2018, a centralized Geospatial Monitoring & Evaluation (M&E) System is being implemented for monitoring CAMPA activities across all States and Union Territories.

For the effective implementation of this system, it is essential to establish a **standardized**, **accurate**, and **validated geospatial database**. This SOP defines the **roles**, **procedures**, and **standards** to be followed by State/UT CAMPA authorities for **data development** and **preparation**.

2. Objective

The objectives of this SOP are:

1. To standardize data collection, preparation, and validation processes
2. To ensure uniformity in spatial and non-spatial datasets across States/UTs
3. To enable seamless integration into the national geospatial platform
4. To ensure accuracy, transparency, and reliability of data

3. Scope

This SOP is applicable to:

1) All State/UTs CAMPA Authorities
2) Activities under:
    1. Chapter I (Mandatory Activities)
    2. Chapter II (Rule 5(2) & 5(3))
    3. Chapter III (Ongoing Schemes)

4. Standard Operating Procedure

4.1 Primary Data Collection & Compilation

a) Database Preparation of Mandatory Activities Under Compensatory Afforestation Fund (CAF) Act, 2016
b) Database Preparation of Activities Supported under Rule 5(2) and 5(3) of Compensatory Afforestation Fund (CAF) Rules, 2018
c) Database Preparation of Ongoing Schemes under National Authority CAMPA

4.2 Legacy Data Compilation

a. Data shall be compiled from 1980 onwards to present

b. Backlog and completed activities must be included
c. Data must be consistent with:
    a) Forest Clearance records
    b) CAMPA Annual Plan of Operation

4.3 Source-Level Verification

a. Data shall be verified by:
    a) State CEO
    b) Divisional Forest Officers (DFO)
b. Validate with:
    c) Approval orders and APOs
c. Duplicate entries must be eliminated (if any)

5. Spatial Data Preparation (KML/Shapefile)

5.1 Data Conversion

a. Convert KML file to layer using GIS Software
b. All datasets shall be converted/Imported into:
    a) File Geodatabase (.gdb)
    b) The feature datasets are to be depicted as point, line, or polygon features, depending on the nature of the work and activity.

5.2 Coordinate System Standardization (if applicable)

a. All datasets shall be reprojected into:
    a) WGS 84 / UTM Zone (as applicable)

5.3 (i) Non-Spatial Data (Attribute) Standardization and Integration with Spatial data (Point, Line and Polygon) for Mandatory Activities and NPV Rule 5(2) & 5(3)

Field Name	Data Type	Description
Activity	Text	4. Activities as per Section 6(a) of CAF Act, 2016 5. Activities as per Rule 5(2) of CAF Rules, 2018 6. Activities as per Rule 5(3) of CAF Rules, 2018
Proposal_No.	Text	Same as FC Proposal in case of Mandatory Activities
Sub_ Activity	Text	4. CA, ACA, PCA, CAT Plan, IWMP, Others 5. 5(2)a to 5(2)m 6. 5(3)a to 5(3)k
Financial_Year	Short Integer	Source-Level Verification
State_Name	Text	Source-Level Verification
District	Text	Source-Level Verification
Division	Text	Source-Level Verification

Range	Text	Source-Level Verification
Land_Type (NFL, DFL, FL)	Text	Source-Level Verification
Work_Type	Text	As aligned in Digital APO
Sub_Work_Type	Text	As aligned in Digital APO
Plantation/Implementation Year	Short Integer	Source-Level Verification
Physical_Target	Double	Source-Level Verification
Financial_Target	Double	Source-Level Verification
Remarks	Text	Any Observation

5.3 (ii) Non-Spatial Data (Attribute) Standardization and Integration with Spatial data (Point, Line and Polygon) for Ongoing Schemes

Field Name	Data Type	Description
Scheme Name	Text	Source-Level Verification
Financial_Year	Short Integer	Source-Level Verification
State_Name	Text	Source-Level Verification
District	Text	Source-Level Verification
Division	Text	Source-Level Verification
Range	Text	Source-Level Verification
Approved_Outlay	Short Integer	Source-Level Verification
Land_Type (as applicable)	Text	Source-Level Verification
Work_Type	Text	Source-Level Verification
Plantation/Implementation Year	Short Integer	Source-Level Verification
Physical_Target	Double	Source-Level Verification
Financial_Target	Double	Source-Level Verification
Remarks	Text	Any Observation

5.4 Data Quality Check & Validation

a. Geometry Validation
b. Topology Validation

    a) Correct errors before submission

5.5 Spatial Accuracy Verification

a. Cross-check with:
    a) Base imagery of the GIS Software
    b) Ensure correct spatial placement

5.6 Attribute Validation

a. Check:
    a) Missing values
    b) Incorrect entries
    c) Duplicate records

b. Cross-Verification

Verify data with:

a) Annual Plan of Operation (APO)
b) Progress Report

5.7 Data Certification & Submission to National Authority CAMPA

a. Data shall be certified by:
   a) State CEO
   b) Divisional Forest Officer
b. Final repository submits to National Authority CAMPA

6. Compliance

All States/UTs must adhere strictly to this SOP

Note: *State/UT CAMPA authorities may engage **1-2 GIS/Remote Sensing (RS) professionals** depending on the volume of work, on a contractual basis for a limited duration to support activities related to data development, preparation, and geospatial monitoring under this SOP.*

*The remuneration and associated costs for such engagement may be met from the **interest accrued on funds available with the State/UT CAMPA**, in accordance with applicable financial rules and guidelines.*

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