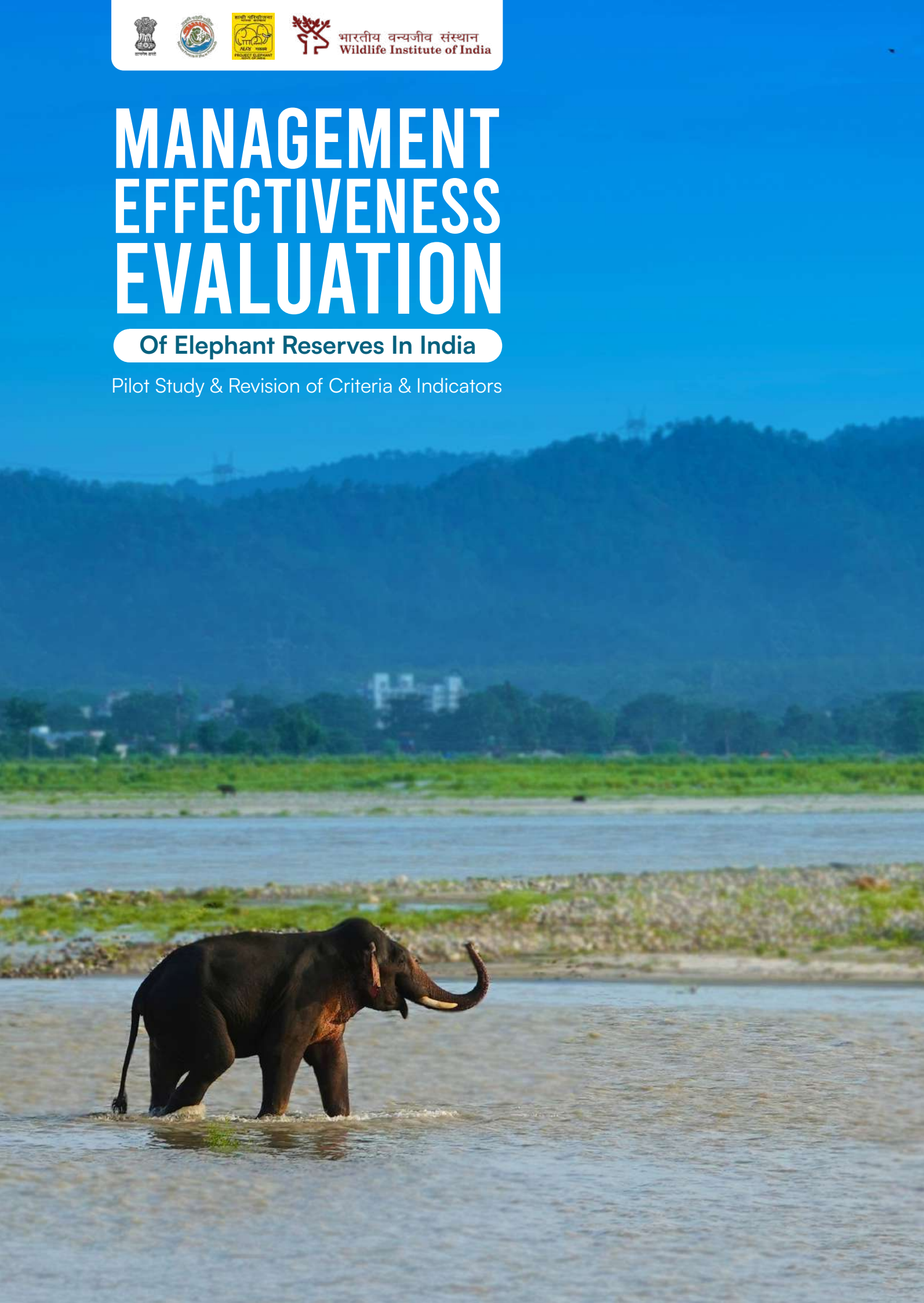
भारतीय वन्यजीव संस्थान
Wildlife Institute of India

MANAGEMENT EFFECTIVENESS EVALUATION

Of Elephant Reserves In India

Pilot Study & Revision of Criteria & Indicators



Project Elephant, Ministry of Environment, Forest and Climate Change, Government of India & Wildlife Institute of India

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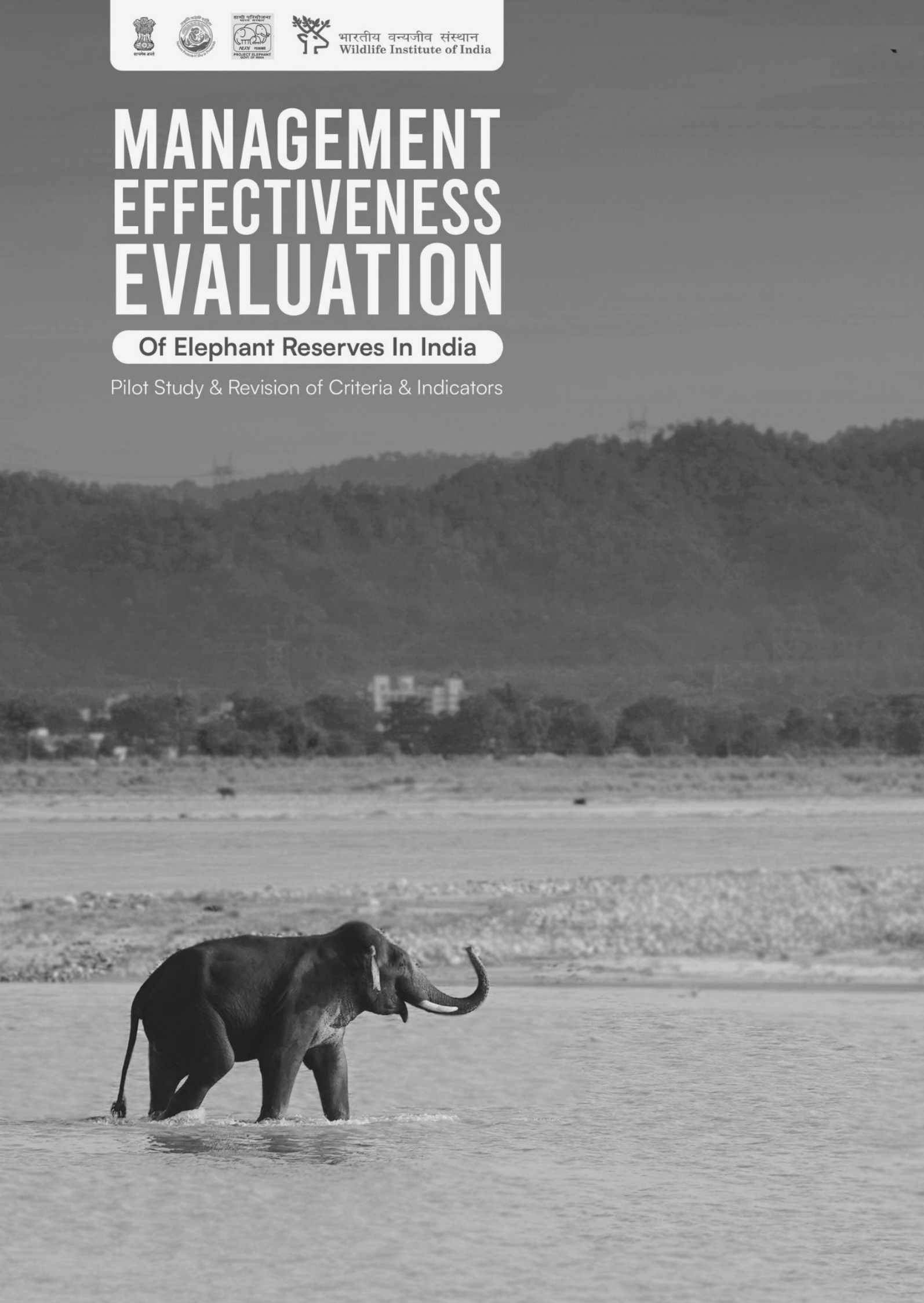
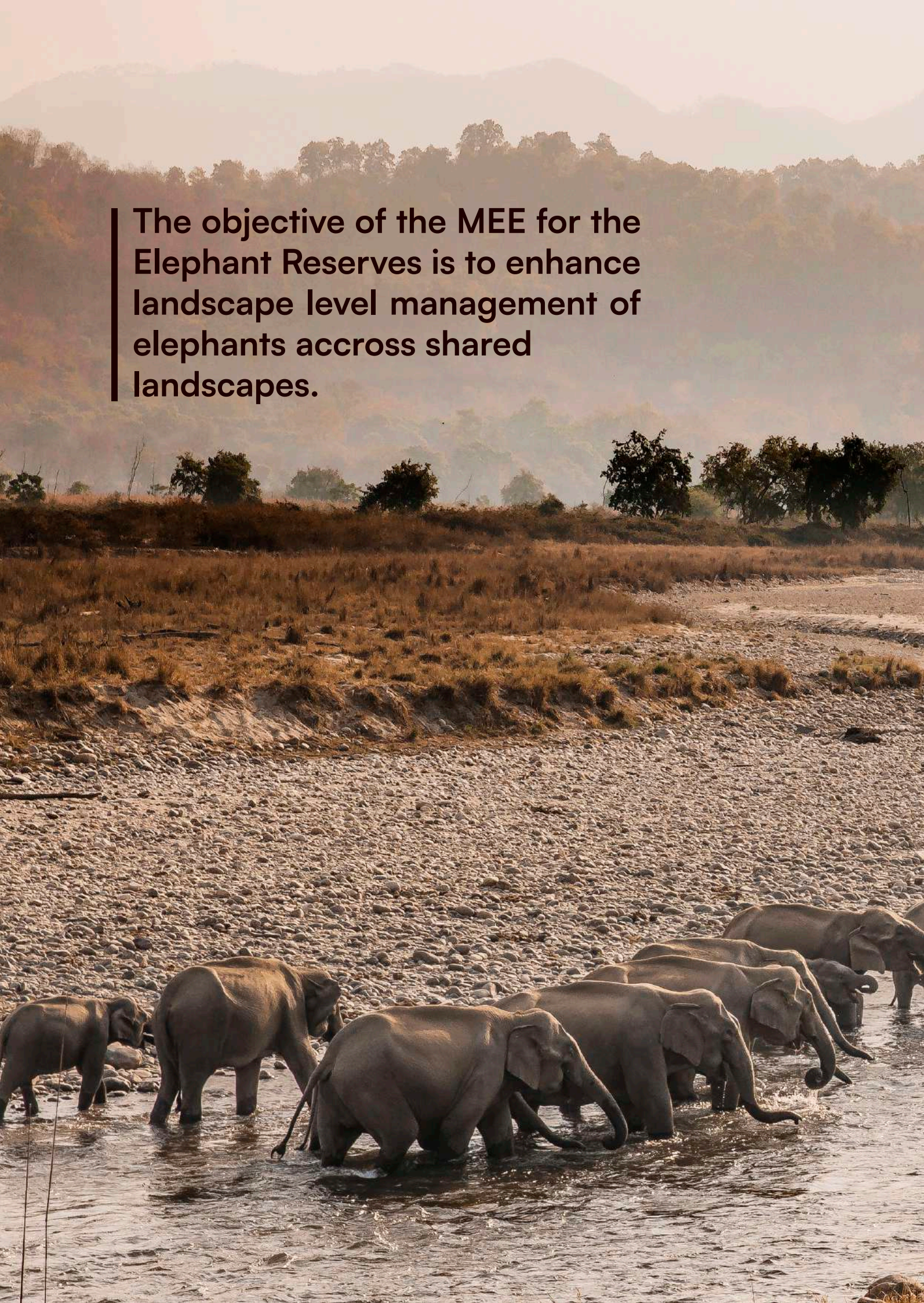
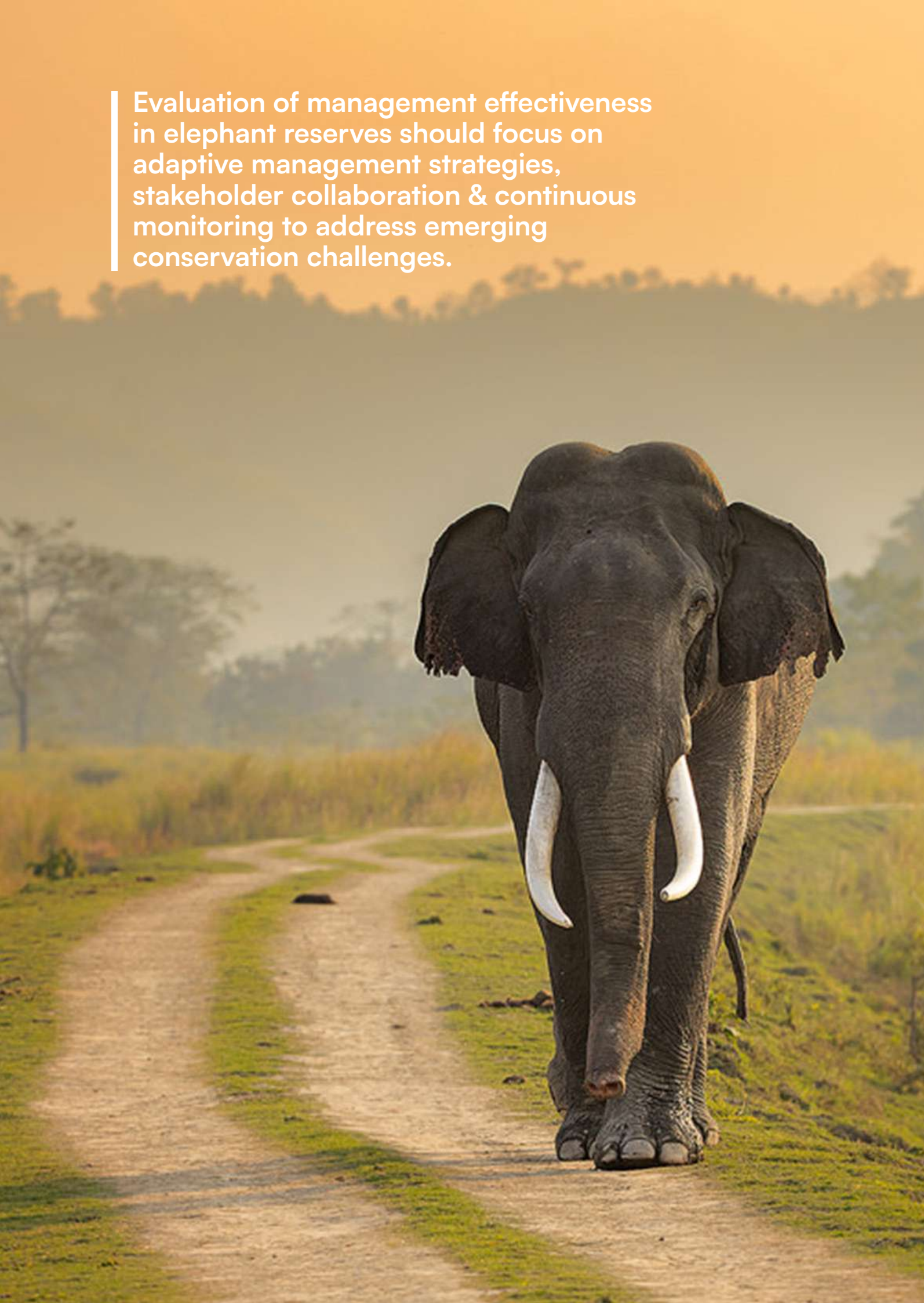


The objective of the MEE for the Elephant Reserves is to enhance landscape level management of elephants accross shared landscapes.



Evaluation of management effectiveness in elephant reserves should focus on adaptive management strategies, stakeholder collaboration & continuous monitoring to address emerging conservation challenges.



भारतीय वन्यजीव संस्थान
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Evaluating management effectiveness helps identify strengths and weaknesses, guiding adaptive strategies for conservation success.

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PREFACE

Elephants have played a crucial role in the rise of Asian civilizations and hence, the species is regarded iconic in the continent. In India, which harbors the largest fraction of population in the wild, elephant range occupies nearly 5% of the country's landmass. While elephants enjoy highest legal protection in India, to stem the threats and foster long-term conservation of the species the Project Elephant was launched during 1992. Landscape units commensurate with elephants' large range needs were notified as Elephant Reserves (ERs). Presently, 33 ERs have been notified in 14 States covering an area of 80,778.7 km^2. The concept of ER is designed for managing landscapes for conservation and protection of elephant. However, there had been a need to further granulize the aspects of management and their assessments.

During the last few years, the Project Elephant has taken numerous steps to reinforce the management implementation in ERs. Project Elephant had prepared important documents and reports such as (i) the Elephant Reserves of India — Atlas Version I and II (ii) Report on Elephant Reserves of India - Land Use and Land Cover Classification, (iii) Elephant Corridors of India 2023 and (iv) Framework for preparation of Elephant Conservation Plan (ECP) for the Elephant Reserves. The Project Elephant initiated the task of evaluating management effectiveness of the ERs to institutionalize activities pertinent to landscape-level elephant management, mainstreaming ERs with the wildlife management and to standardize elephant specific management requirements for better management of elephant habitats and population. In this regard, the MEE-ER (Management Effectiveness Evaluation of Elephant Reserves in India) providing required guidelines, criteria and indicators was released during April 2023.

The guidelines, criteria and indicators for MEE-ER were tested (on pilot basis) in four ERs from the four elephant-bearing regions of India. The ERs include the Shivalik ER in Uttarakhand (northwest region), Kaziranga-Karbi Anglong ER in Assam (north-east region), Mayurbhanj ER in Odisha (east-central region) and the Nilgiri ER (southern region) by involving a team of seasoned foresters and scientists. Based on the lessons learnt during the pilot MEE-ER, the guidelines were thoroughly reviewed, criteria and indicators were evaluated and adequacy of the overall MEE process was validated. The present report elucidates on the pilot MEE-ER process and brings revised criteria and indicators for evaluating management effectiveness of the ERs.

Elephant reserves being composite and heterogeneous areas the criteria and indicators for management effectiveness evaluation of Elephant Reserves in India may further evolve in future considering the results and outcomes of the MEE exercise in different ERs of the country and inputs from the ER managers. We sincerely hope that this can provide renewed focus in harmonizing management of ERs by taking up the task of evaluating management effectiveness of the ERs so that the ecological needs of elephants are adequately addressed for larger conservation value.

Ramesh Kumar Pandey, IFS
Inspector General of Forests (PT&E)
& Director, Project Elephant

PROLOGUE

Management effectiveness evaluation (MEE) is an assessment to gauge the performance of Protected Areas in terms of accomplishing their values and specified goals. The MEE has gained considerable attraction in India and has lately emerged as an important tool for the Protected Area managers as the assignment allows an objective retrospection of various spheres of management. Although originally intended for the Protected Areas, the ambit of MEE extended to zoos and Tiger Reserves because of its overall utility to the managers. It is gladdening the Project Elephant has taken earnest efforts to bring Elephant Reserves under the purview of MEE. Carrying out MEE for Elephant Reserves is challenging, as large areas are often included in the reserve that might encompass two or more Forest Divisions. Further, the Elephant Reserves might also encompass areas that do not fall under the jurisdiction of the Forest Department directly, but still needs to judiciously managed to ensure habitat and population viability. Elephant corridors occurring in human-use areas exemplify this. Notwithstanding these complexities, the drafting committee came up with reasonable criteria, which were duly field tested and suitably modified for easy field implementation. Due to these focused efforts, implementing MEE for the Elephant Reserves is possible and would augur well for the reserves as hitherto unnoticed aspects of the management can now be objectively prioritized. I congratulate the Project Elephant for steering the pilot testing of MEE-ER with active support from the Elephant Cell at WII. I am hopeful that Elephant Reserve management will take a step forward in the right direction.

Virendra Tiwari, IFS
Director, WII

CHAPTERS

ANNEXURE

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CHAPTER 01

INTRODUCTION

INTRODUCTION

1.1 Background

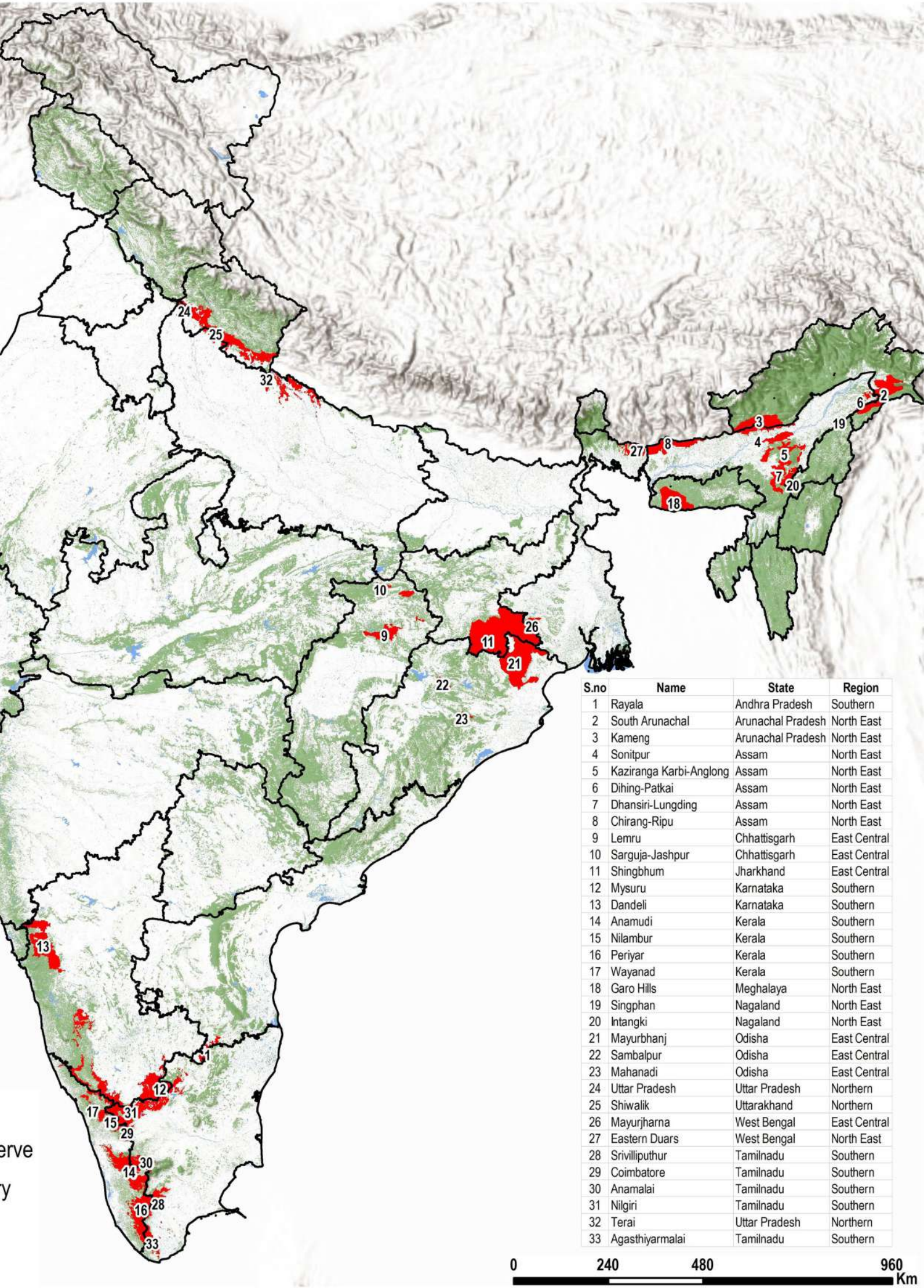
Elephant Reserves (ERs) are the fundamental management unit for the Project Elephant, which was launched by the Government of India during 1992. The concept of "landscape approach" to elephant conservation is central to Project Elephant considering elephants' large range requirements. Elephant home ranges estimated across different landscapes of India span 100 to 3000 km^2 with profound site-specific and individual-specific variations. India has notified 33 Elephant Reserves as of 2023. The total extent of the ERs in India in the present is 80,778.7 km^2, which are distributed across mosaic habitats in all the four major elephant-bearing regions. The smallest ER in India is Singphan (23.5 km^2) in Nagaland and the largest is Singhbhum (13,440 km^2) in Jharkhand. The ERs are spread across 14 States. The concept of Elephant Reserves encompasses areas much beyond the Protected Areas, Tiger Reserves and even forest areas. It may be noted that < 20% of elephant range in India occurs within the designated Protected Areas. Elephant ranges that are often spread across one or more states might include several ERs. Since ERs emanate out of the landscape approach encompassing heterogeneous areas across diverse management jurisdictions, promulgating ER management would be an essential step towards better management of the elephant ranges. With this aim, the Project Elephant envisioned conducting evaluation of the ERs on the lines similar to Management Evaluation and Effectiveness (MEE) for the Protected Areas and Tiger Reserves (Project Elephant – 2023, MEE-ER Guidelines, criteria and indicators report). The MEE for the ER is intended to identify conceptual, administrative and legal aspects relevant to ER so that essential indices from those can be integrated into management.WW

Subsequently, during the 16th project elephant steering committee meeting it was proposed to develop criteria and indicators for MEE of the ERs of India. Accordingly, an eight-member drafting committee was constituted to develop guidelines, criteria and indicators for evaluation. The committee, in collaboration with the Elephant Cell at the Wildlife Institute of India prepared the framework for MEE-ER (Project Elephant – 2023, MEE-ER Guidelines, criteria and indicators report).

Table 1.1 Elephant Reserves of India

S.N	Name	State	Region	Area
1	Rayala	Andhra Pradesh	Southern	766.0
2	South Arunachal	Arunachal Pradesh	North East	1892.0
3	Kameng	Arunachal Pradesh	North East	1957.5
4	Sonitpur	Assam	North East	1420.0
5	Kaziranga Karbi Anglong	Assam	North East	3270.0
6	Dihing Patkai	Assam	North East	937.0
7	Dhansiri Lungding	Assam	North East	2740.0
8	Chirang Ripu	Assam	North East	2600.0
9	Lemru	Chhattisgarh	East Central	1995.5
10	Sarguja-Jashpur	Chhattisgarh	East Central	1143.3
11	Shingbhum	Jharkhand	East Central	13440.0
12	Mysuru	Karnataka	Southern	8055.9
13	Dandeli	Karnataka	Southern	2321.0
14	Anamudi	Kerala	Southern	3728.0
15	Nilambur	Kerala	Southern	1419.0
16	Periyar	Kerala	Southern	3742.0
17	Wayanad	Kerala	Southern	1200.0
18	Garo Hills	Meghalaya	North East	3500.0
19	Singphan	Nagaland	North East	23.5
20	Intangki	Nagaland	North East	202.0
21	Mayurbhanj	Odisha	East Central	3213.8
22	Sambalpur	Odisha	East Central	427.0
23	Mahanadi	Odisha	East Central	1038.3
24	Uttar Pradesh	Uttar Pradesh	Northern	744.0
25	Shiwalik	Uttarakhand	Northern	5406.0
26	Mayurjharna	West Bengal	East Central	414.0
27	Eastern Duars	West Bengal	North East	978.0
28	Srivilliputhur	Tamilnadu	Southern	1249.0
29	Coimbatore	Tamilnadu	Southern	566.0
30	Anamalai	Tamilnadu	Southern	1457.0
31	Nilgiri	Tamilnadu	Southern	4663.0
32	Terai	Uttar Pradesh	Northern	3072.3
33	Agasthiyarmalai	Tamilnadu	Southern	1197.5
		Total		**80778.7**

There are 33 elephant reserves spread across 14 states, covering an area of 80,778.7 sq. km.



S.no	Name	State	Region
1	Rayala	Andhra Pradesh	Southern
2	South Arunachal	Arunachal Pradesh	North East
3	Kameng	Arunachal Pradesh	North East
4	Sonitpur	Assam	North East
5	Kaziranga Karbi-Anglong	Assam	North East
6	Dihing-Patkai	Assam	North East
7	Dhansiri-Lungding	Assam	North East
8	Chirang-Ripu	Assam	North East
9	Lemru	Chhattisgarh	East Central
10	Sarguja-Jashpur	Chhattisgarh	East Central
11	Shingbhum	Jharkhand	East Central
12	Mysuru	Karnataka	Southern
13	Dandeli	Karnataka	Southern
14	Anamudi	Kerala	Southern
15	Nilambur	Kerala	Southern
16	Periyar	Kerala	Southern
17	Wayanad	Kerala	Southern
18	Garo Hills	Meghalaya	North East
19	Singphan	Nagaland	North East
20	Intangki	Nagaland	North East
21	Mayurbhanj	Odisha	East Central
22	Sambalpur	Odisha	East Central
23	Mahanadi	Odisha	East Central
24	Uttar Pradesh	Uttar Pradesh	Northern
25	Shiwalik	Uttarakhand	Northern
26	Mayurjharna	West Bengal	East Central
27	Eastern Duars	West Bengal	North East
28	Srivilliputhur	Tamilnadu	Southern
29	Coimbatore	Tamilnadu	Southern
30	Anamalai	Tamilnadu	Southern
31	Nilgiri	Tamilnadu	Southern
32	Terai	Uttar Pradesh	Northern
33	Agasthiyarmalai	Tamilnadu	Southern

1.2 FRAMEWORK FOR ASSESSING THE MEE OF ELEPHANT RESERVE — PILOT PHASE

MEE framework of Elephant Reserves included six elements- Context, Planning, Input, Process, Output and Outcomes. Each element was assessed on basis of 44 criteria (indicator/ questions). Explanatory notes, wherever needed were provided to guide the assessment process. The scores along with observations provided better understanding of the situation in the site. Against each criterion, the evaluation team had to indicate 'Reference document(s)' and also provide remarks, as appropriate. The scores by themselves may not be adequate in providing the complete picture unless supported by considered observation (remarks) that qualify such scores. The list of the elements against the 44 indicators/ questions in given in Table 1.2.

Table-1.2 Questions under each element in the MEE framework

S. No.	Element Name	Indicator name/ Questions
1	Context	1.1 Are the values of the ER defined, assessed & documented to secure the long-term conservation of elephants? 1.2 Are the threats to the ER identified, assessed & documented in the ER landscape? 1.3 Is there inter/intra sectoral coordination between adjoining administrative units across the district and states of the elephant reserve for managing elephant population? 1.4 Is the ER management able to limit anthropogenic and development pressure?
2	Planning	2.1 Is the ER properly identified and demarcated to achieve the management objectives? 2.2 Does the existing plans have strategies (TCP, Management plan, Working plan and Zonal Plans (Eco-sensitive Zones to guide and steer the goals of elephant conservation in the reserve? 2.3 Is the Management Plan (TCP, Management plan, working plan and Zonal Plan) routinely and systematically up-dated? 2.4 Is the institutional planning and monitoring framework of the ERs developed to address the threats in the elephant Reserve? 2.5 Is the institutional planning and monitoring framework of the ERs developed to address the threats in the elephant Reserve? 2.6 Is the ER integrated into wider ecological network at the land-scape level to include corridors for elephant movement?

		2.7 Does the ER safeguard the threatened biodiversity values, most vital for long term conservation of elephants? 2.8 Are stakeholders including communities given an opportunity to participate in planning? 2.9 Are habitat management programmes systematically planned and monitored? 2.10 Does the ER have an adequate protection strategy? 2.11 Does the ER have an action plan for management (including compensation for Loss) of human-elephant conflicts?
3	Input	3.1 Are personnel adequate, well organised and deployed with access to adequate resources in the ER? 3.2 Are resources (communication, equipment, infrastructure etc.) adequate, well distributed and managed with desired access? 3.3 Are financial resources both State and central linked to priority actions and are funds adequate, released timely and utilized? 3.4 Does the ER have adequate manpower and other resources to carry out enforcement actions? 3.5 What level of resources is provided by civil society organization?
4	Process	4.1 Does the management units of ER have trained manpower resources for effective management? 4.2 Does the staff performance of management units of ER, linked to achievement of management objectives? 4.3 Does the ER encourage stakeholder's participation in Management activities? 4.4 Is the ER conducting veterinary surveillance and monitoring disease in the landscape? 4.5 Is there a responsive system for handling complaints and comments about ER management? 4.6 Does ER management addresses the livelihood issues of resource dependent communities? 4.7 Does the ER have captive facility for orphan and conflict elephant population? 4.8 Does the ER use innovative techniques/ technologies for management (conservation, education, research, rescue and rehabilitation) efforts? 4.9 Does the ER have necessary support structure for management (including compensation for loss) of Human Elephant conflict? 4.10 Does the ER manage the water resources including wetland appropriately?

5	Output	5.1 Is adequate information on ER management publicly available? 5.2 Are visitor services (tourism and interpretation) and facilities appropriate and adequate? 5.3 Are research/ monitoring related trends systematically evaluated, routinely reported and used to improve management? 5.4 Is there a systematic maintenance schedule and funds in place for management of infrastructure/assets? 5.5 Is the habitat management Programme executed, monitored, evaluated as planned? 5.6 Is the fire management program executed, monitored, evaluated as per protocol? 5.7 Does the ER show preparedness to respond to emergencies arising during Human elephant conflict, occurrence of fires, floods and natural disasters?

6	Outcomes	6.1 Are populations of elephants declining, stable or increasing? 6.2 Has the ER been able to manage the Human Elephant conflict? 6.3 Have the threats to the ER due to poaching, habitat degradation (weeds, fire, fragmentation etc.) & infrastructure development pressures being reduced/ minimized? 6.4 Does the ER address the organization goals for human resource development? 6.5 Does the ER education and awareness programmes enhance visitor-learning experience? 6.6 Are local communities supportive of ER management? 6.7 Are research outcomes relevant and support conservation? 6.8 Does the ER consciously manage activities adapting to Climate Change and disaster risk reduction?

CHAPTER 02

PROCESS & METHODOLOGY

PROCESS & METHODOLOGY

2.1 SELECTION OF THE PILOT SITES

In the 18th Project Elephant Steering Committee meeting held at Kaziranga National Park, Assam under the chairmanship of the Hon'ble Minister of Environment, Forests and Climate Change, it was proposed to conduct MEE-ER in four ERs from all the four elephant-bearing regions of India considering the diversity of ecological and cultural landscapes in which elephants occur in the country. The criteria for selecting the ERs were that each reserve should be representative of the respective regional population. Accordingly, Shivalik Elephant Reserve in Uttarakhand (from the northern population), Kaziranga – Karbi – Anglong Elephant Reserve in Assam (from the north-east population), Mayurbhanj Elephant Reserve in Odisha (from the East-Central population) and Nilgiri Elephant Reserve in Tamilnadu (from the Southern population were selected for piloting MEE of ER.

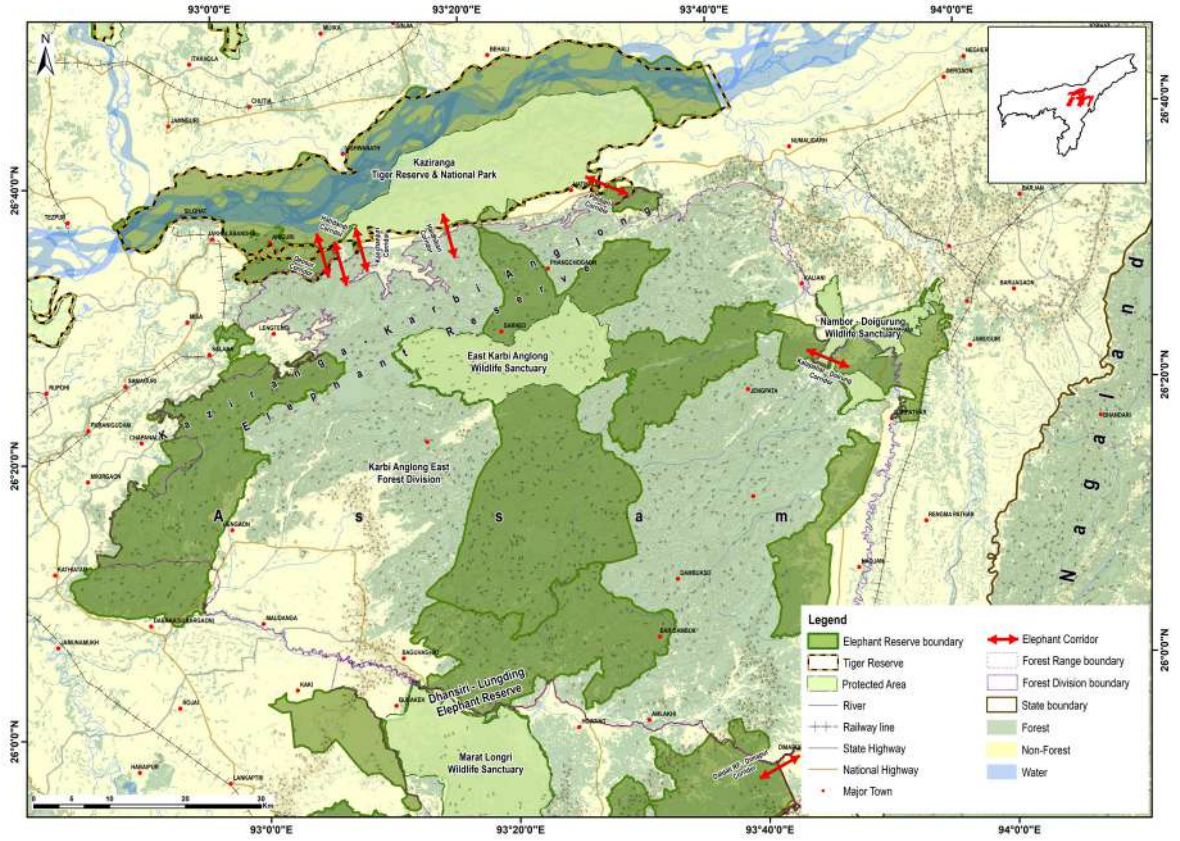
The team composition was as under:

TEAM 1 - Kaziranga- Karbi Anglong Elephant Reserve
1. Sh. B. S. Bonal, IFS, (R) Former PCCF (HoFF), Assam (Chairperson)
2. Sh. Vinod Kr. Yadav, Retd. CWLW, WB
3. Dr. Bhibuti Lahkar, Division Head, Aaranyak.
4. Dr. Bilal Habib, Scientist F, WII
5. Ms. Aakriti Singh, SRF, Elephant Cell, WII

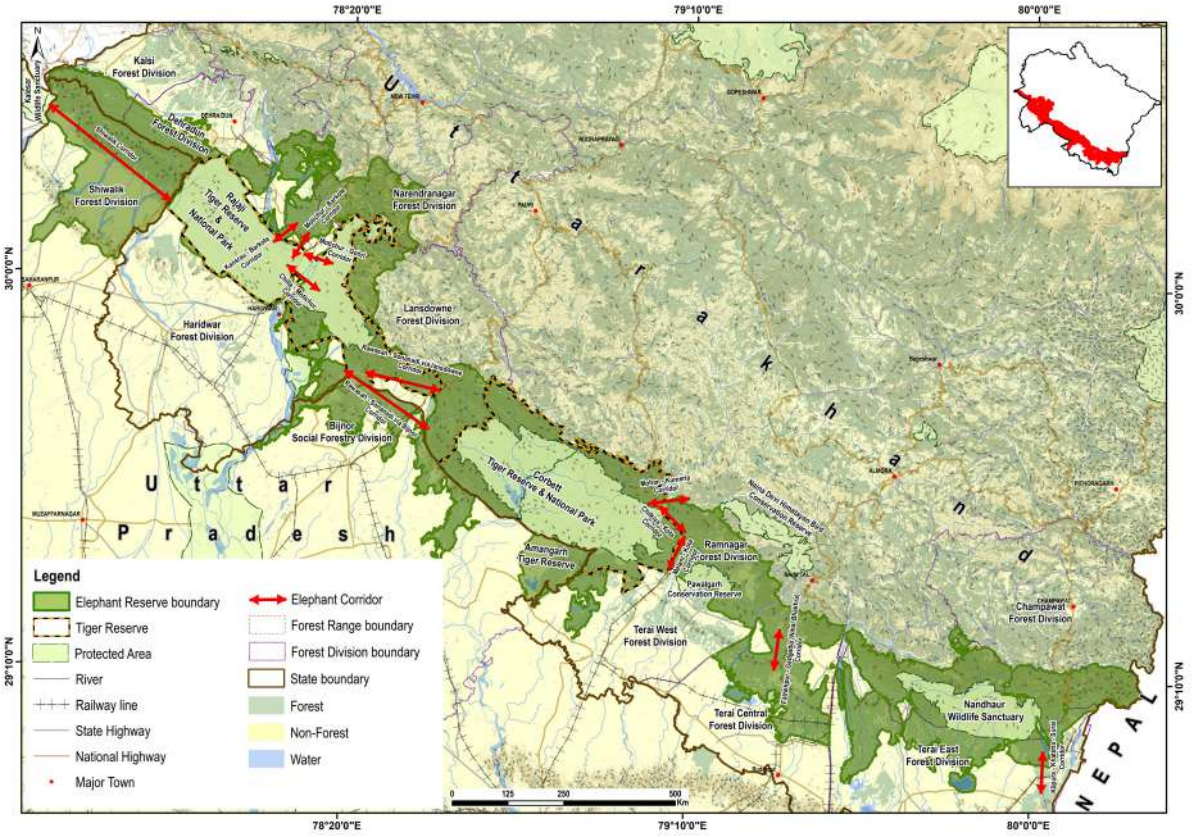
TEAM 2 - Mayurbhanj Elephant Reserve
1. Sh. B K Patnaik, IFS (R) Former PCCF (HoFF), Uttar Pradesh) (Chairperson)
2. Dr. Anup K. Nayak (Retd. ADG-PT & MS- NTCA), Bhubaneswar
3. Dr. B. S. Adhikari, Scientist G, WII
4. Dr. N. Lakshminarayan, Project Scientist, Elephant Cell.
5. Sh. Aditya Bisht, Consultant B, Elephant Cell.

TEAM 3 - Shivalik Elephant Reserve
1. Sh. P. C. Tyagi, IFS (R) Former PCCF (HoFF), Tamil Nadu (Chairperson)
2. Dr H. S. Upadhay, IFS, Former CWLW, Kerala
3. Dr. Bivash Pandav, Scientist G, WII
4. Dr. Anil Kumar Singh, Team Leader, TAL, WWF-India
5. Sh. Aditya Bisht Consultant-B, Elephant Cell.

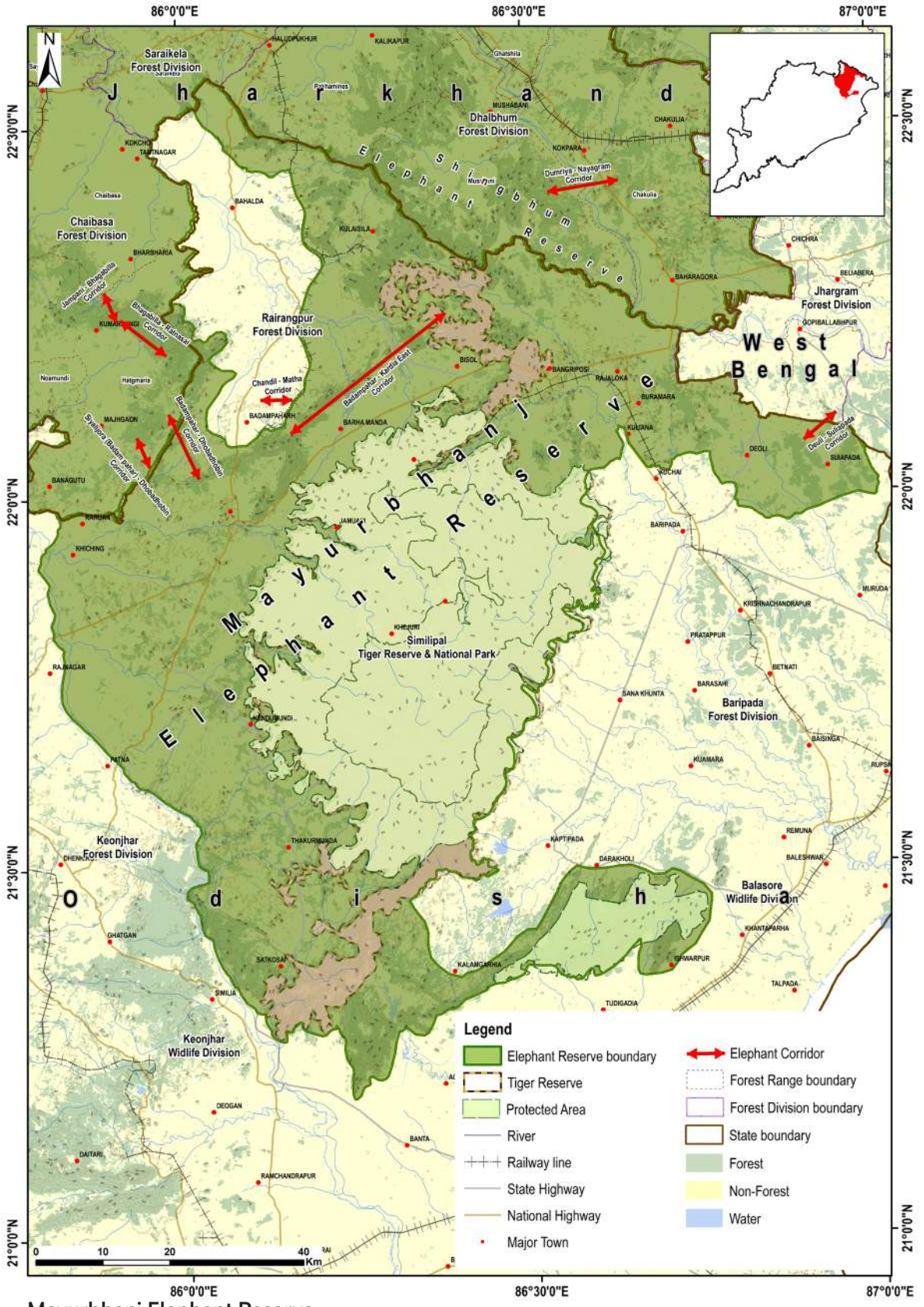
TEAM 4 - Nilgiri Elephant Reserve
1. Sh. Sanjay K Srivastava IFS (R), Former PCCF, Tamil Nadu (Chairperson)
2. Sh. Surendra Kumar, IFS (R), Former CWLW Kerala
3. Dr. Parag Nigam, Scientist G, WII
4. Dr. K. Muthamizh Selvan, Scientist E, MoEF&CC, Delhi



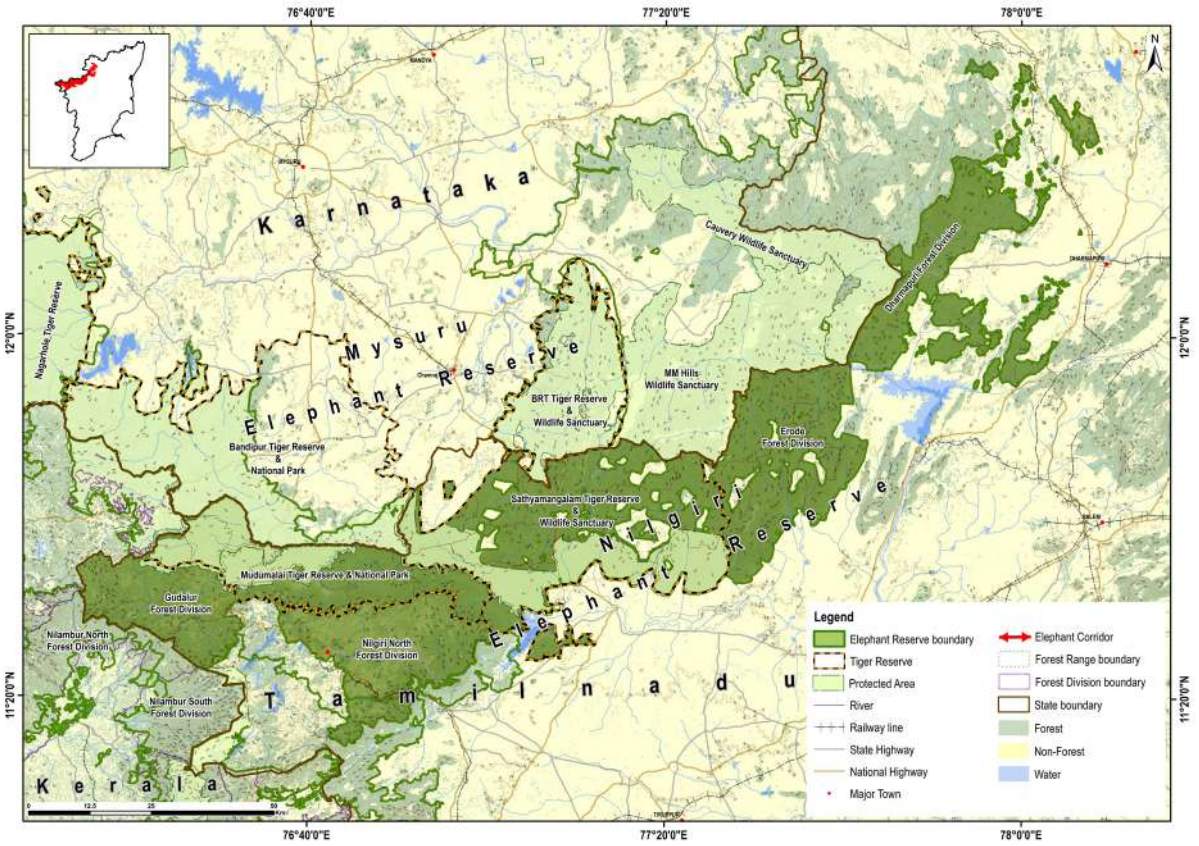
Kaziranga-Karbi Anglong Elephant Reserve



Shivalik Elephant Reserve



Mayurbhanj Elephant Reserve



Nilgiri Elephant Reserve

2.2 ASSESSMENT CRITERIA, PROCESS AND SCORING METHOD

The MEE teams visited the 4 ERs to conduct MEE of the 4 pilot sites as detailed below:

S. No	Name of ER	Period
1	Kaziranga- Karbi Anglong Elephant Reserve	23rd to 27th September 2023
2	Mayurbhanj Elephant Reserve	3rd October to 7th October 2023
3	Shivalik Elephant Reserve	8th Oct to 12th Oct 2023
4	Nilgiri Elephant Reserve	26th Sept to 30th Sept 2023

For the assessment of six elements of the MEE - ER framework against 44 criteria, the format was communicated to all the ERs for Self-Assessment.

Subsequently, the MEE teams evaluated the respective Self-Assessment Reports of the ERs and assigned their scores/ ratings on all 44 criteria based on their own assessment against each criterion as per the Likert scale from the 4 options as given below in the table-2.1.

Table 2.1 Rating and scoring of the indicators

Rating	Individual Score
Poor	2.5
Fair	5
Good	7.5
Very Good	10

A score of 2.5 represents the lowest management effectiveness, a score of 5 represents average management effectiveness, a score of 7.5 represents good but below optimal management effectiveness and a score of 10 represents optimal management effectiveness.

The teams also included their observations in the 'Remarks' column along with the relevant Reference document(s)" including field photographs. In addition to the site reports, the teams also provided the report on 1) Management Strengths, 2) Management Weaknesses and 3) Actionable Points for each ER. The same has been placed at Annexures I, II, III and IV.

CHAPTER 03

RESULTS & DISCUSSION

RESULTS & DISCUSSION

The results and discussion of MEE are crucial for interpreting the findings and providing insights into the overall performance of the management team as well as the elephant reserve.

It provides information on the key performance indicators (KPIs) used to measure management effectiveness; baseline information for benchmarking; trends and patterns observed in the data; and strengths and weaknesses of the management team based on the evaluation results.

It also provides a detailed interpretation of each data point or metric in the context of management effectiveness and how the same relates to the broader organizational goals including various factors contributing to the observed results.

3.1 SELF-ASSESSMENT PROCESS BY ER

Assessing the MEE of an elephant reserve is a critical task that involves evaluating various aspects to ensure the conservation and well-being of elephants and their habitats.

Self-assessment by the field officers (Field Directors in respect of Tiger Reserves; Wildlife Wardens/ DFO (WL) in respect of Protected Areas; and territorial DFOs in respect of Forest divisions) on management effectiveness is an important exercise for personal and professional development.

3.2 ASSESSMENT BY THE EVALUATOR

This comprehensive assessment framework covers various dimensions of elephant reserve management, providing a holistic view of effectiveness. The assessment by the evaluator is conducted after on-site visits, interviews, and data analysis to ensure a well-meaning evaluation.

With respect of the 4 pilot-sites, different methodologies have been followed in scoring the various criteria and indicators as given below:

1. By Simple Average of 44 Criteria taking Self-Assessment of different divisions: (Kaziranga-Karbi Anglong Elephant Reserve)

2. By Direct Assessment of the 44 Criteria of all the units together by the Evaluator: (Mayurbhanj Elephant Reserve)

3. By weighted average of the 6 Gross Criteria taking Self-Assessment of different divisions: (Shivalik Elephant Reserve)

4. By weighted average of 44 Criteria taking Assessment of different units by the Evaluator: (Nilgiri Elephant Reserve)

3.3 CRITERIA ADOPTED FOR RATIONALIZING THE MEE RATING / SCORE

In the absence of an Elephant Conservation Plan (ECP) for the Elephant Reserves (ER) and the availability of numerous plans viz. Tiger Conservation Plan (TCP) for Tiger Reserve (TR), Management Plan (MP) for Protected Area (PA) and Working Plan (WP) for Forest Division (FD) and also because of separate administrative control of various territorial units, the rating/ scoring of different criteria in the Management Effectiveness Evaluation (MEE) form, as followed in respect of Nilgiri Elephant Reserve is considered to be a more prudent option.

Illustration: Nilgiri Elephant Reserve (NER)

1. Since there is different rating/ score for all the territorial units of the Nilgiri Elephant Reserve (2 TRs, 1 PA and 4 FDs), the rating/ score has been normalized taking into consideration the elephant population and area of habitat available for the elephant. The multiplication product so computed has been converted into percent for providing weightage to the respective territorial units (Table-3.1). The area and number of elephants is to derive weightage for the different units of the elephant reserve. This mechanism is not going the influence the weightage between the elephant reserves. This method or mechanism shall be used as a baseline to infer trends in subsequent MEE exercises for the elephant reserves.

2. Self-assessment of the different territorial units has been done by the respective field officers (Table 3.2).

3. The self-assessment of all the territorial units has been considered by the Evaluator including previous MEE ratings carried out of the 2 TRs and 1 PA in the ER, along with the reference documents provided and field inspections of the units to arrive at the proposed rating/ score on all the assessment criteria of individual units (Table 3.3).

Table-3.1: Calculation of Weightage for the different territorial units

Divisions	Area	ER Habitat	Nos	ER Habitat * Nos	%	Weightage
Mudumalai TR	688.59	588.82	790	465168	26.74	0.267
Nilgiris	527.57	311.48	21	6541	0.38	0.004
Gudalur	468.18	116.63	80	9330	0.54	0.005
Sathy TR	1455.31	1455.31	668	972147	55.88	0.559
Erode	821.47	784.57	158	123962	7.13	0.071
Dharmapuri	1600.00	400.00	144	57600	3.31	0.033
Hosur	1492.00	1000.00	105	105000	6.04	0.060
Total	**7053.12**	**4656.81**	**1966**	**1739748**	**100.00**	**1.000**

4. The weighted average rating/ score for each criterion has been arrived at by multiplying the proposed rating/ score accorded for that criterion of the (respective) territorial unit by the calculated weightage and then arriving at the weighted average as given in the undermentioned formula:

Weighted Average for each Criteria

[(MPR*0.267)+(NPR*0.004)+(GPR*0.005)+(SPR*0.559)+(EPR*0.071)+(DPR*0.033)+(HPR*0.060)]

(Where: MPR means proposed rating for Mudumalai TR.....and HPR for Hosur FD)

Example for Criteria 1.1 *(refer Table-3.2)*

Weighted Average: [(10*0.267)+(5*0.004)+(2.5*0.005)+(10*0.559)+(5*0.071)+(7.5*0.033)+(7.5*0.06)] = **9.35**

(Whereas by Simple average we would have got [(10+5+2.5+10+5+7.5+7.5) / 7] = **6.79**)

5. The final rating/ score has been provided by taking the weighted average into 4 ordinal scales (Table 3.4)

Range (Weighted Average)	Final Rating
< 3.75	2.5
3.75 – 6.25	5
6.25 – 8.75	7.5
> 8.75	10

(So, in the above example, for the weighted average of 9.35, final rating would be 10)

3.4 FINAL EVALUATION APPROACH

MODIFICATION OF CRITERIA PROPOSED FOR RATIONALIZING THE MEE RATING / SCORE

Dr. Sanjay Srivastava (Retd PCCF & HoFF, Tamil Nadu) came up with a novel method of using weighted average scores to rank administrative areas within the ER. For calculating the weighted average, the elephant population size of the individual Forest Divisions was used. During the review meeting held on 12th January 2024 under the chairmanship of ADG (PT&E) and Member Secretary, NTCA, it was suggested that using the population size of elephants to rank Forest Divisions might not be the right approach since there would be inherent variation in the elephant numbers in different areas regardless of protection and other management interventions. For areas with no elephants, the value will be zero, irrespective of having potential habitat.

Thus, while the use of weighted averages can take into account the varying degrees of importance of the numbers in the dataset putting them together as a single average may have an effect on the ranking of various units of the elephant reserve (Relative importance of different units of the Elephant Reserve). For example, if the part of the elephant reserve has no elephants (Population = 0) the importance of the area may be lost owing to the absence of the elephants in the reserve (Average Raking = 0). To overcome this discrepancy, we have come up with a revised approach of considering both area and density separately. This approach shall weigh different units according to the area and the number of individuals per unit area. In this case, if any unit of the elephant reserve, will have no elephants, the average because of the area will be reflected in the final weightage. This approach also compensates for the loss of weightage for smaller areas if numbers are better. For example, in Table 3.4 Mudumalai TR and Sathy TR have comparable populations, but Mudumalai gets a better score (0.272) for having more elephants in a smaller area as compared to Sathy TR (0.228). The weighatages for these tiger reserves as per the previous approach are 0.267 and 0.559 for Mudumalai TR and Sathy TR, respectively. The example in Table 3.1 is reworked as per the revised approach and the details are given in Table 3.4.

Table 3.4: Calculation of Weightage for the different territorial units (Revised Approach)

Divisions	Area	ER Habitat	ER Population	Density (Number/ Area)	Relative Weightage (Habitat) (Unit Area/ Total Area)	Relative Weightage (Density) (Unit Density/ Total Density)	Total Weightage (Average of Habitat & Density
Mudumalai TR	688.59	588.82	790	1.342	0.126	0.417	0.272
Nilgiris	527.57	311.48	21	0.067	0.067	0.021	0.044
Gudalur	468.18	116.63	80	0.686	0.025	0.213	0.119
Sathy TR	1455.31	1455.31	668	0.459	0.313	0.143	0.228
Erode	821.47	784.57	158	0.201	0.168	0.063	0.116
Dharma-puri	1600.00	400.00	144	0.360	0.086	0.112	0.099
Hosur	1492.00	1000.00	105	0.105	0.215	0.033	0.124
Total	**7053.12**	**4656.81**	**1966**	**3.22**	**1.000**	**1.000**	**1.000**

Relative Weightage for Habitat

Area of the site/Total area of all the sites

Relative Weightage for Numbers (Density)

Elephant density at a given site/Average elephant density for all the sites x N (No. of Sites)

The weighted average rating/ score for each criterion has been arrived at by multiplying the proposed rating/ score accorded for that criterion of the (respective) territorial unit by the calculated weightage and then arriving at the weighted average as given in the undermentioned formula:

Weighted Average for each Criteria

[(MPR*0.272)+(NPR*0.044)+(GPR*0.119)+(SPR*0.228)+

(EPR*0.116)+(DPR*0.099)+(HPR*0.124)]

(Where: PR means proposed rating for Madumalai TR.... and HPR for Hossur FD)

Example for Criteria 1.1

Weighted Average: [(10*0.272) +(5*0.044) +(2.5*0.119) +(10*0.228) + (5*0.116) +(7.5*0.099) +(7.5*0.124)] = **7.77**

Table-3.2: Rating/ Score on assessment criteria by various administrative units of NER

ASSESSMENT CRITERIA	SELF - ASSESSMENT RATING / SCORE							SA AVERAGE
	MTR	Nilgiris	Gudalur	STR	Erode	Dharmapuri	CWLS-Hosur	
1. Context								
1.1 Values	10	5	7.5	10	7.5	10	7.5	8.21
1.2 Threats	10	5	7.5	10	7.5	10	7.5	8.21
1.3 Second Cooedination	7.5	7.5	10	10	10	10	10	9.29
1.4 Anthropogenic & Dev. Pressures	5	7.5	7.5	10	7.5	7.5	7.5	7.50
Sub-Total	**32.5**	**25**	**32.5**	**40**	**32.5**	**37.5**	**32.5**	**33.21**
2. Planning								
2.1 Demarcation	5	10	10	10	10	10	10	9.29
2.2 Existing Plans & Strategy	7.5	10	10	10	10	10	7.5	9.29
2.3 Updating on Existing Plan	10	10	10	10	10	10	10	10.00
2.4 Monitoring of Threats	7.5	7.5	7.5	10	7.5	10	7.5	8.21
2.5 Landscape & Corridors	7.5	7.5	10	10	10	10	10	9.29
2.6 Threatened Biodiversity Values	10	5	7.5	10	7.5	10	10	8.57
2.7 Participation of Stakeholders	10	5	5	10	10	7.5	10	8.21
2.8 Habitat Restoration Plans	10	7.5	7.5	10	10	7.5	7.5	8.57
2.9 Protection Strategy	7.5	7.5	10	10	10	10	10	9.29
2.10 Human-Elephant Conflict	7.5	7.5	10	10	10	10	10	9.29
Sub-Total	**82.5**	**77.5**	**87.5**	**100**	**95**	**95**	**92.5**	**90.00**
3. Input								
3.1 Personnel Adequacy	10	5	7.5	10	7.5	7.5	7.5	7.86
3.2 Resources Adequacy	10	7.5	10	10	5	7.5	7.5	8.21
3.3 Finance Adequacy	7.5	7.5	5	10	5	7.5	7.5	7.14
3.4 Manpower Adequacy	10	5	5	10	7.5	7.5	7.5	7.50
3.5 Civil Society Contribution	7.5	5	5	5	2.5	10	10	6.43
Sub-Tatol	**45**	**30**	**32.5**	**45**	**27.5**	**40**	**40**	**37.14**
4. Process								
4.1 Trained Manpower	10	5	5	10	10	7.5	7.5	7.86
4.2 Staff Performance	7.5	7.5	7.5	10	10	7.5	7.5	8.21
4.3 Stakeholder Participation	10	7.5	7.5	7.5	10	10	10	8.93
4.4 Veterinary Surveillance	10	7.5	10	10	10	10	10	9.64
4.5 Complaints Monitoring	10	7.5	10	10	10	10	7.5	9.29
4.6 Livelihood Issues	10	7.5	10	10	10	10	10	9.64
4.7 Captive Facility	10	2.5	2.5	10	10	10	10	7.86
4.8 Innovative Techniques	7.5	5	10	5	7.5	7.5	7.5	7.14
4.9 Support Structure for HEC	10	10	10	10	10	10	10	10.00
4.10 Water Resources Management	10	7.5	10	7.5	10	10	10	9.29
Sub-Total	**95**	**67.5**	**82.5**	**90**	**97.5**	**92.5**	**90**	**87.86**
5. Output								
5.1 Information to Public	10	5	5	10	10	10	7.5	8.21
5.2 Visitor Services	10	5	10	2.5	7.5	7.5	7.5	7.14
5.3 Research & Monitoring	10	5	5	7.5	7.5	7.5	7.5	7.14
5.4 Maintenance Schedule	10	7.5	7.5	7.5	7.5	7.5	7.5	7.86
5.5 Habitat Management	7.5	7.5	7.5	7.5	10	10	7.5	8.21
5.6 Fire Management	10	7.5	10	7.5	10	10	7.5	8.93
5.7 Disaster Management	10	5	7.5	10	10	10	10	8.93
Sub-Total	**67.5**	**42.5**	**52.5**	**52.5**	**62.5**	**62.5**	**55**	**56.43**
6. Outcomes								
6.1 Population Status	10	10	10	10	10	10	10	10.00
6.2 HEC Management	10	7.5	10	10	7.5	10	10	9.29
6.3 Threats Management	5	7.5	10	7.5	7.5	10	7.5	7.86
6.4 HRD	10	10	10	10	7.5	7.5	7.5	8.93
6.5 Visitor Learning	10	5	7.5	10	7.5	7.5	7.5	7.86
6.6 ER Support	7.5	10	7.5	10	10	10	10	9.29
6.7 Research Outcome	7.5	7.5	7.5	7.5	5	7.5	7.5	7.14
6.8 Climate Change & DRR	7.5	10	10	7.5	7.5	7.5	7.5	8.21
Sub-Total	**67.5**	**67.5**	**72.5**	**72.5**	**62.5**	**70**	**67.5**	**68.57**
Total	**390**	**310**	**360**	**360**	**377.5**	**397.5**	**377.5**	**373.21**
Percent	**88.64**	**70.45**	**81.82**	**81.82**	**85.80**	**90.34**	**85.80**	**84.82**

Table-3.3: Proposed Rating/ Score, Simple & Weighted Averages and Final Rating

ASSESSMENT CRITERIA	PROPOSED RATING / SCORE							AVERAGE	WEIGHTED AVERAGE	FINAL RATING
	MTR	Nilgiris	Gudalur	STR	Erode	Dharmapuri	CWLS-Hosur			
1. Context										
1.1 Values	10	5	2.5	10	5	10	7.5	6.79	9.35	10
1.2 Threats	10	5	5	10	5	10	7.5	7.50	9.44	10
1.3 Second Cooedination	7.5	7.5	7.5	7.5	7.5	10	10	8.21	7.73	7.5
1.4 Anthropogenic & Dev. Pressures	5	7.5	2.5	10	7.5	7.5	7.5	6.43	6.80	7.5
Sub-Total	**32.5**	**25**	**17.5**	**35**	**25**	**35**	**32.5**	**28.93**	**33.31**	**35**
2. Planning										
2.1 Demarcation	5	5	5	5	5	5	5	5.00	5.00	5
2.2 Existing Plans & Strategy	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.50	7.49	7.5
2.3 Updating on Existing Plan	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.50	7.49	7.5
2.4 Monitoring of Threats	7.5	7.5	5	7.5	7.5	7.5	7.5	7.14	7.48	7.5
2.5 Landscape & Corridors	10	10	7.5	10	10	10	10	9.64	9.98	10
2.6 Threatened Biodiversity Values	7.5	5	5	7.5	7.5	7.5	7.5	6.79	7.47	7.5
2.7 Participation of Stakeholders	10	5	5	10	7.5	7.5	7.5	7.50	9.54	10
2.8 Habitat Restoration Plans	10	7.5	7.5	10	7.5	7.5	7.5	8.21	9.56	10
2.9 Protection Strategy	7.5	7.5	7.5	7.5	10	10	10	8.57	7.90	7.5
2.10 Human-Elephant Conflict	7.5	7.5	7.5	7.5	10	10	10	8.57	7.90	7.5
Sub-Total	**80**	**70**	**65**	**80**	**80**	**80**	**80**	**76.43**	**79.81**	**80**
3. Input										
3.1 Personnel Adequacy	10	5	7.5	7.5	7.5	7.5	7.5	7.50	8.15	7.5
3.2 Resources Adequacy	10	7.5	7.5	10	5	7.5	7.5	7.86	9.38	10
3.3 Finance Adequacy	7.5	7.5	5	7.5	5	7.5	7.5	6.79	7.30	7.5
3.4 Manpower Adequacy	10	5	5	7.5	7.5	7.5	7.5	7.14	8.14	7.5
3.5 Civil Society Contribution	7.5	5	5	5	2.5	7.5	10	6.07	5.87	5
Sub-Tatol	**45**	**30**	**30**	**37.5**	**27.5**	**37.5**	**40**	**35.36**	**38.84**	**37.5**
4. Process										
4.1 Trained Manpower	7.5	5	5	7.5	5	7.5	7.5	6.43	7.29	7.5
4.2 Staff Performance	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.50	7.49	7.5
4.3 Stakeholder Participation	10	7.5	5	7.5	7.5	10	10	8.21	8.38	7.5
4.4 Veterinary Surveillance	10	7.5	7.5	10	7.5	7.5	7.5	8.21	9.56	10
4.5 Complaints Monitoring	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.50	7.49	7.5
4.6 Livelihood Issues	10	7.5	7.5	10	10	10	10	9.29	9.97	10
4.7 Captive Facility	10	2.5	2.5	5	5	5	10	5.71	6.61	7.5
4.8 Innovative Techniques	7.5	5	5	7.5	5	7.5	7.5	6.43	7.29	7.5
4.9 Support Structure for HEC	10	10	10	10	10	10	10	10.00	9.99	10
4.10 Water Resources Management	10	7.5	10	7.5	10	10	10	9.29	8.58	7.5
Sub-Total	**90**	**67.5**	**67.5**	**80**	**75**	**82.5**	**87.5**	**78.57**	**82.66**	**82.5**
5. Output										
5.1 Information to Public	7.5	5	5	7.5	5	10	7.5	6.43	7.29	7.5
5.2 Visitor Services	10	5	5	5	7.5	7.5	7.5	6.79	6.74	7.5
5.3 Research & Monitoring	10	5	5	7.5	5	7.5	7.5	6.79	7.96	7.5
5.4 Maintenance Schedule	10	7.5	7.5	7.5	7.5	7.5	7.5	7.86	8.16	7.5
5.5 Habitat Management	7.5	7.5	7.5	7.5	7.5	10	7.5	7.50	7.49	7.5
5.6 Fire Management	10	7.5	10	7.5	7.5	10	7.5	8.57	8.26	7.5
5.7 Disaster Management	10	5	7.5	10	10	10	10	8.93	9.96	10
Sub-Total	**65**	**42.5**	**47.5**	**52.5**	**50**	**57.5**	**55**	**52.86**	**55.86**	**55**
6. Outcomes										
6.1 Population Status	10	10	10	10	10	10	10	10.00	9.99	10
6.2 HEC Management	10	7.5	7.5	10	7.5	10	10	8.93	9.79	10
6.3 Threats Management	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.50	7.49	7.5
6.4 HRD	10	10	7.5	10	7.5	7.5	7.5	8.57	9.57	10
6.5 Visitor Learning	10	5	7.5	10	7.5	7.5	7.5	7.86	9.55	10
6.6 ER Support	7.5	10	7.5	7.5	7.5	10	10	8.57	7.74	7.5
6.7 Research Outcome	7.5	7.5	7.5	7.5	5	7.5	7.5	7.14	7.32	7.5
6.8 Climate Change & DRR	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.50	7.49	7.5
Sub-Total	**70**	**65**	**62.5**	**70**	**60**	**67.5**	**67.5**	**66.07**	**68.93**	**70**
Total	**382.5**	**300**	**290**	**355**	**317.5**	**360**	**362.5**	**338.21**	**359.40**	**360**
Percent	**86.93**	**68.18**	**65.91**	**80.68**	**72.16**	**81.82**	**82.39**	**76.87**	**81.68**	**81.82**

(Note: Figures in 'Red' indicate reduction in the proposed rating with reference to the Self-Assessment provided by the territorial units; and 'Green' figures indicate increase in the proposed rating)

The final rating/ score in respect of the 4 pilot sites, envisaging different methodologies is detailed as under:

1. By Simple Average of Criteria taking Self-Assessment of different divisional units of ER: Kaziranga-Karbi Anglong Elephant Reserve

Frame-work Element Number	Frame-work Element Name	Number of Ques-tions (a)	Maximum Mark per question (b)	Total (a x b)	Marks obtained for the Element	Overall Score
1.	Context	04	10	40	25	Marks obtained/ Total Marksx100 = 65.91%
2.	Planning	10	10	100	72.5	
3.	Inputs	05	10	50	32.5	
4.	Process	10	10	100	67.5	
5.	Outputs	07	10	70	45	
6.	Outcomes	08	10	80	47.5	
TOTAL		**44**		**440**	**290**	

2. By overall assessment of the Criteria of all the units together by the Evaluator: Mayurbhanj Elephant Reserve

Frame-work Element Number	Frame-work Element Name	Number of Ques-tions (a)	Maximum Mark per question (b)	Total (a x b)	Marks obtained for the Element	Overall Score
1.	Context	04	10	40	32.5	Marks obtained/ Total Marksx100 = 72.39%
2.	Planning	10	10	100	80.0	
3.	Inputs	05	10	50	35.0	
4.	Process	10	10	100	62.5	
5.	Outputs	07	10	70	52.5	
6.	Outcomes	08	10	80	55.0	
TOTAL		**44**		**440**	**318.5**	

3. By weighted average of the gross Criteria taking Self-Assessment of different div. units of ER: Shivalik Elephant Reserve

Frame-work Element Number	Frame-work Element Name	Number of Ques-tions (a)	Maximum Mark per question (b)	Total (a x b)	Marks obtained for the Element	Overall Score
1.	Context	04	10	40	32.5	Marks obtained/ Total Marksx100 = 78.40%
2.	Planning	10	10	100	82.5	
3.	Inputs	05	10	50	35	
4.	Process	10	10	100	80	
5.	Outputs	07	10	70	55	
6.	Outcomes	08	10	80	60	
TOTAL		**44**		**440**	**345**	

4. By weighted average of all the Criteria taking Assessment of different units by the Evaluator: Nilgiri Elephant Reserve

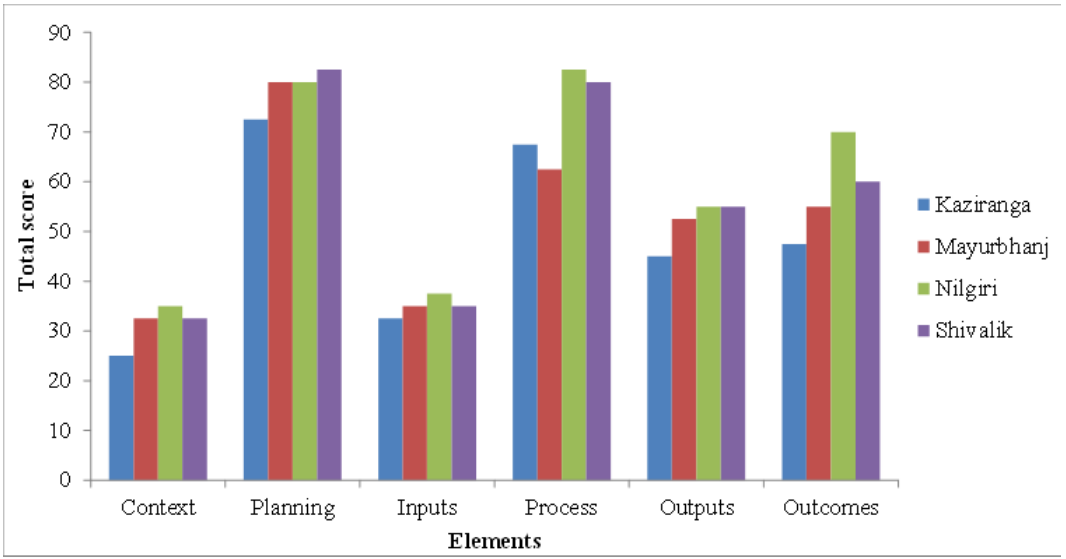
Frame-work Element Number	Frame-work Element Name	Number of Ques-tions (a)	Maximum Mark per question (b)	Total (a x b)	Marks obtained for the Element	Overall Score
1.	Context	04	10	40	35	Marks obtained/ Total Marksx100 = 81.82%
2.	Planning	10	10	100	80	
3.	Inputs	05	10	50	37.5	
4.	Process	10	10	100	82.5	
5.	Outputs	07	10	70	55	
6.	Outcomes	08	10	80	70	
TOTAL		**44**		**440**	**360**	

Overall Rating of Pilot Sites

S. No	Elephant Reserve	MEE Score (%)	MEE Rating
1	Kaziranga- Karbi Anglong	65.91	Good
2	Mayurbhanj	73.39	Good
3	Nilgiri	81.82	Very Good
4	Shivalik	78.40	Very Good

NOTE: The MEE Score and Rating of the four elephant reserves selected for the pilot run does not reflect the actual ranking or MEE scores of these elephant reserves. The reserves were selected and tested for the pilot run — these scores neither reflect nor are actual MEE scores. Different methods were evaluated across the sites to come up with the final MEE process for the elephant reserves.

Element-wise overall performance of MEE



3.5 RELEVANCY AND APPROPRIATENESS OF CRITERIA AND INDICATORS

For assessment of 6 elements of MEE framework for elephant reserves, 44 criteria indicators have been developed with 4 options to choose from and provide rating/ score after referring to the explanatory notes/ indicative reference documents/ photographs etc.

The MEE of Tiger Reserves (TR) and Protected Areas (PA) is being evaluated as per the existing Tiger Conservation Plans (TCP) and Management Plans (MP), respectively. However, MEE of the ERs is more challenging as most of the ERs comprise of a combination of 1 or more TRs, PAs and Forest divisions unlike MEE of TRs and PAs. In the absence of the Elephant Conservation Plan (ECP), the responses for the different criteria for the 6 elements envisage thorough scrutiny of the existing TCP, MP and Working Plans (WP) besides Zonal Master Plans (ZMP) for the Eco-sensitive Zones (ESZ).

After pilot evaluation following modifications are done on the MEE framework as under:

1. Modifications in the MEE Format: Considering landscape level approach in respect of the elephants, certain criteria/ options needed modification as proposed in the table 3.4

S. No.	Assessment Criteria	Modification proposed	Remarks
	Updation of Existing Plans (2.3)	Updation is different from the Revision of the Plan and therefore criteria 2.3 needs more clarity	The term 'Revised' has been added
	Landscape & Corridors (2.5)	We need to add migration paths also along with the corridors in criteria no. 2.5	The term 'Migration path' has been added
	Habitat Restoration Plans (2.8)	In option 4 for criteria no. 2.8, it should be termed as 'scientifically' & not 'thoroughly' planned (e g. RS/ GIS)	The term 'scientifically' has been substituted in place of 'thoroughly'
	HEC Action Plan (2.10)	The criteria no. 2.10 should also include crop choices in the adjoining agricultural landscape/ESZ & control over indiscriminate electrical/ solar fencing in the farmlands	The suggestion of the inclusion of the crop choices in the adjoining agricultural landscape/ ESZ & control over indiscriminate electrical/ solar fencing in the farmlands, has been incorporated in the 'Explanatory Note'.
	Captive Facility (4.7)	Option 3 for criteria no. 4.7 should be with veterinary support and not without veterinary support	The word 'without' has been replaced by 'with' veterinary support
	HEC Support Structure (4.9)	In criteria no. 4.9 the term 'timely' may be added before... including compensation for the loss	The word 'timely' has been inserted in the main criteria to read as (including 'timely' compensation for loss)
	Disaster Management (5.7)	HEC may be taken out & put as a separate Output due to 2.10 & 4.9 or vice-versa for ecological based disasters considering separate outcome for climate change and disaster risk reduction vide criteria no. 6.8	A new criterion 5.8 has been incorporated as an Output for emergencies during HEC, which at present has been clubbed with the emergencies due to fire, flood and natural disasters and criterion 5.7 has been modified appropriately

2. Harmonization of the MEE Rating/ Score: In the absence of an Elephant Conservation Plan (ECP) for the Elephant Reserves (ER) and availability of numerous plans viz. Tiger Conservation Plan (TCP) for Tiger Reserve (TR), Management Plan (MP) for Protected Area (PA) and Working Plan (WP) for Forest Division (FD) and also because of separate administrative control of various territorial units, the rating/ scoring of different criteria in the Management Effectiveness Evaluation (MEE) form has to be rationalized. It is resolved to normalize the rating/ score by considering the elephant population and area of habitat for the elephants by weighted averages in the rating (Methodology has been detailed in chapter 3.3).

3. Change Matrix: It represents the change in the MEE with reference to the previous year. It is considered important and may be adopted from the 'second' MEE report. This provides upgrading and downgrading in the scores on the six elements with justification. This will add seriousness to the evaluation on the part of the evaluator as well as the field officials and will exactly help in knowing the improvement/ decline on various criteria.

4. Compliance on Immediate Actionable Points: From the 'second' MEE report, this also has to be included to ensure that whatever actions are suggested in the previous MEE, are reviewed in the subsequent MEE. This may also form one of the monitoring protocols in the Elephant Conservation Plan (ECP).

3.7 REVISED CRITERIA AND INDICATORS AFTER PROPOSED MODIFICATIONS

The revised criteria and indicators after proposed modifications are as under:

2.3 Is the Management Plan (TCP, Management plan, working plan and Zonal Plan) routinely and systematically updated and revised?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
No process in place for systematic review, updating and revision of TCP, Management plan, Working plan and Zonal Plan	Poor (Score 2.5)			
TCP, Management plan, working plan and Zonal Plan sometimes updated and revised in adhoc manner.	Fair (Score 5)			

TCP, Management plan, working plan and Zonal Plan routinely and systematically updated and revised.	Good (Score 7.5)			
TCP, Management plan, working plan and Zonal Plan routinely, systematically and scientifically updated and revised through a participatory process.	Very good (Score 10)			
Explanatory note: The assessment should take into account the revision/revisiting of the management plans to update or revise information on elephants and other aspects. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

2.5 Is the ER integrated into wider ecological network at the landscape level to include corridors and migration paths for elephant movement?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER not integrated into a wider ecological network/ landscape.	Poor (Score 2.5)			
Some limited attempts to integrate the ER into an ecological network/ landscape.	Fair (Score 5)			
ER is generally quite well integrated into an ecological network/ landscape.	Good (Score 7.5)			
ER is fully integrated into a wider ecological network/ landscape.	Very good (Score 10)			
Explanatory note: Assessment needs to consider the scope of opportunities in the landscape scale that exist for setting a wider ecological network (corridors and migration paths), its identification and protection. What actions are planned/ implemented for their security? Have the TCP, Management plan, Forest Working Plan, Forest Development Corporation plan and Biosphere plans within the identified landscapes taken cognizance of such new requirement? Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

2.8 Are habitat management programmes systematically planned and monitored?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Habitat restoration programmes are entirely adhoc.	Poor (Score 2.5)			
Habitat Restoration programmes have limited planning and monitoring inputs	Fair (Score 5)			
Habitat restoration programmes are generally well planned and monitored.	Good (Score 7.5)			
Habitat restoration programmes are scientifically planned and monitored.	Very good (Score 10)			
Explanatory note: This assessment should be primarily based on habitat management programmes for amelioration of the habitats of elephants Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

2.10 Does the ER have an action plan for management (including compensation for Loss) of human-elephant conflicts?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not have any strategy/action plan for management of conflict.	Poor (Score 2.5)			
ER has minimal and adhoc strategy/action plan for management of conflict.	Fair (Score 5)			
ER has a general strategy/ action plan for management of conflict.	Good (Score 7.5)			
ER has a comprehensive and effective strategy/action plan for management of conflict.	Very good (Score 10)			
Explanatory note: This assessment takes inter-alia into account the extent and nature of HEC, and plans to address such threats by setting up adequate number of Anti depredation squads (primary Response team/rapid response team/community-based response teams) in vulnerable areas, organizing foot and mobile patrolling, with sufficient available manpower, supported by equipment, infrastructure and fire arms. The coordination with other wings of the Forest Department/ Police/ Customs etc. and setting up of coordination committee at District and state level and its effectiveness needs to be assessed.				

Further to be considered are the crop choices in the adjoining agricultural landscape/ ESZ & control over indiscriminate electrical/ solar fencing in the farmland and mitigation measures envisaged including preventive measures/deterrents and compensation mechanism for loss of life, injury and damage to property, crop insurance and community based eco-development activities.
Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. National HWC mitigation strategy and action plan, guidelines for mitigation of HEC, National elephant conservation action plan and corridor plans

4.7 Does the ER have captive facility for orphan and conflict elephant population?

Assessment criteria	Rating/Score	(Tick √)	Reference document(s)/ photos	Remarks
ER does not have any captive elephant management facility	Poor (Score 2.5)			
ER does have a basic captive elephant management facility without veterinary support and equipment	Fair (Score 5)			
ER does have captive elephant management facility with equipment but with veterinary support	Good (Score 7.5)			
ER does have an adequate captive elephant management facility with equipment, veterinary support and transport facility	Very good (Score 10)			

Explanatory note: This assessment will take into account rescue and rehabilitation facility, veterinary support and equipment including kraal and enrichment.
Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (reference to HWC and captive facility)

4.9 Does the ER have necessary support structure for management (including timely compensation for loss) of Human Elephant conflict?

Assessment criteria	Rating/Score	(Tick √)	Reference document(s)/ photos	Remarks
Human-elephant conflicts are rampant with no support infrastructure	Poor (Score 2.5)			

ER has been able to mitigate few human-wildlife conflicts and has basic/little support infrastructure	Fair (Score 5)			
ER has been able to mitigate many human-wildlife conflicts and has sufficient support infrastructure	Good (Score 7.5)			
ER has been able to comprehensively mitigate human-wildlife conflicts and have adequate support infrastructure.	Very good (Score 10)			
Explanatory note: The assessment should take into account the mitigation of Human Elephant conflict based on sound planning and availability of human resource, infrastructure and support including timely compensation for crop damage, injury and death of humans. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan (Reference to HWC and captive facility).				

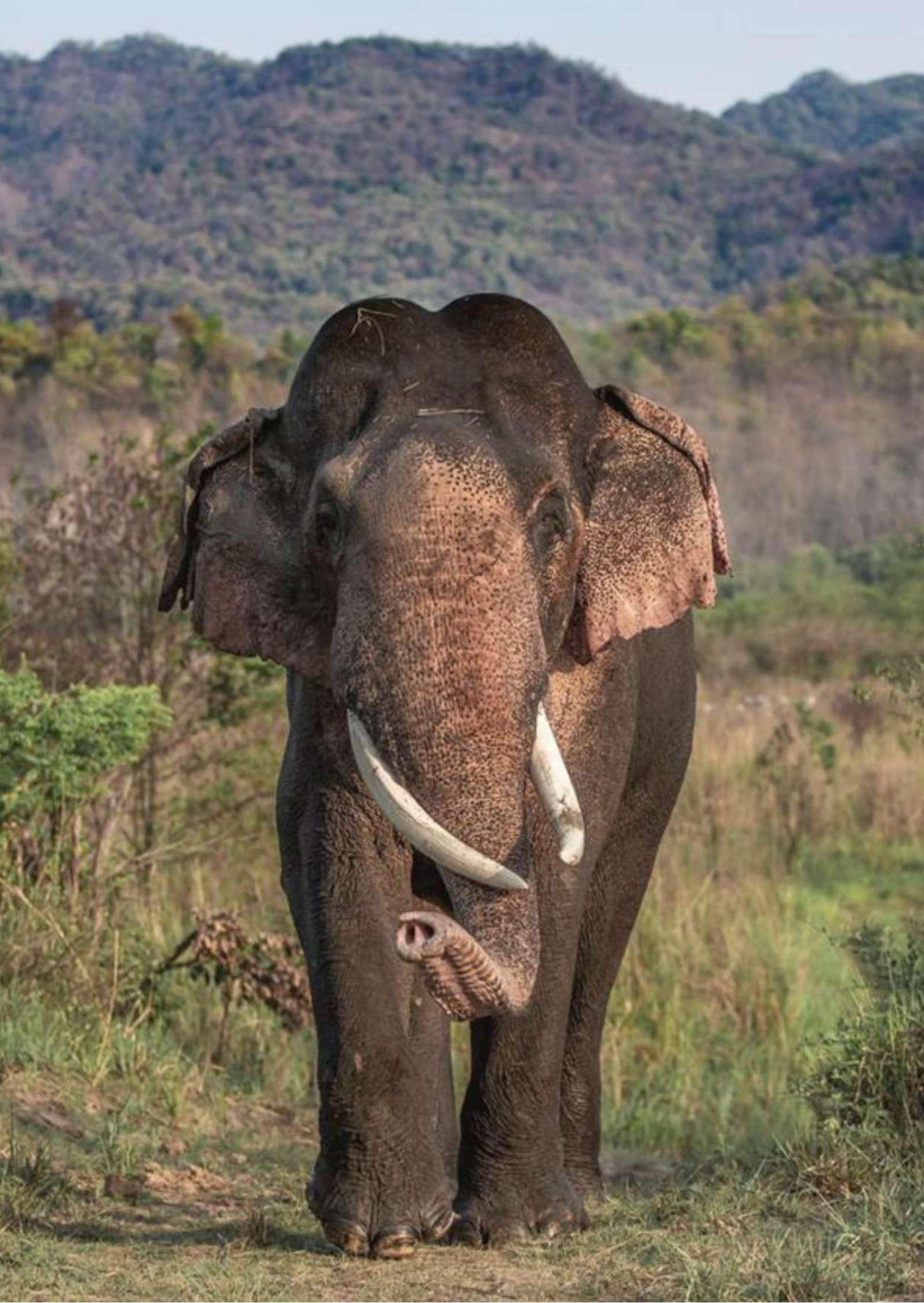
5.7 Does the ER show preparedness to respond to emergencies arising during occurrence of fires, floods and natural disasters?

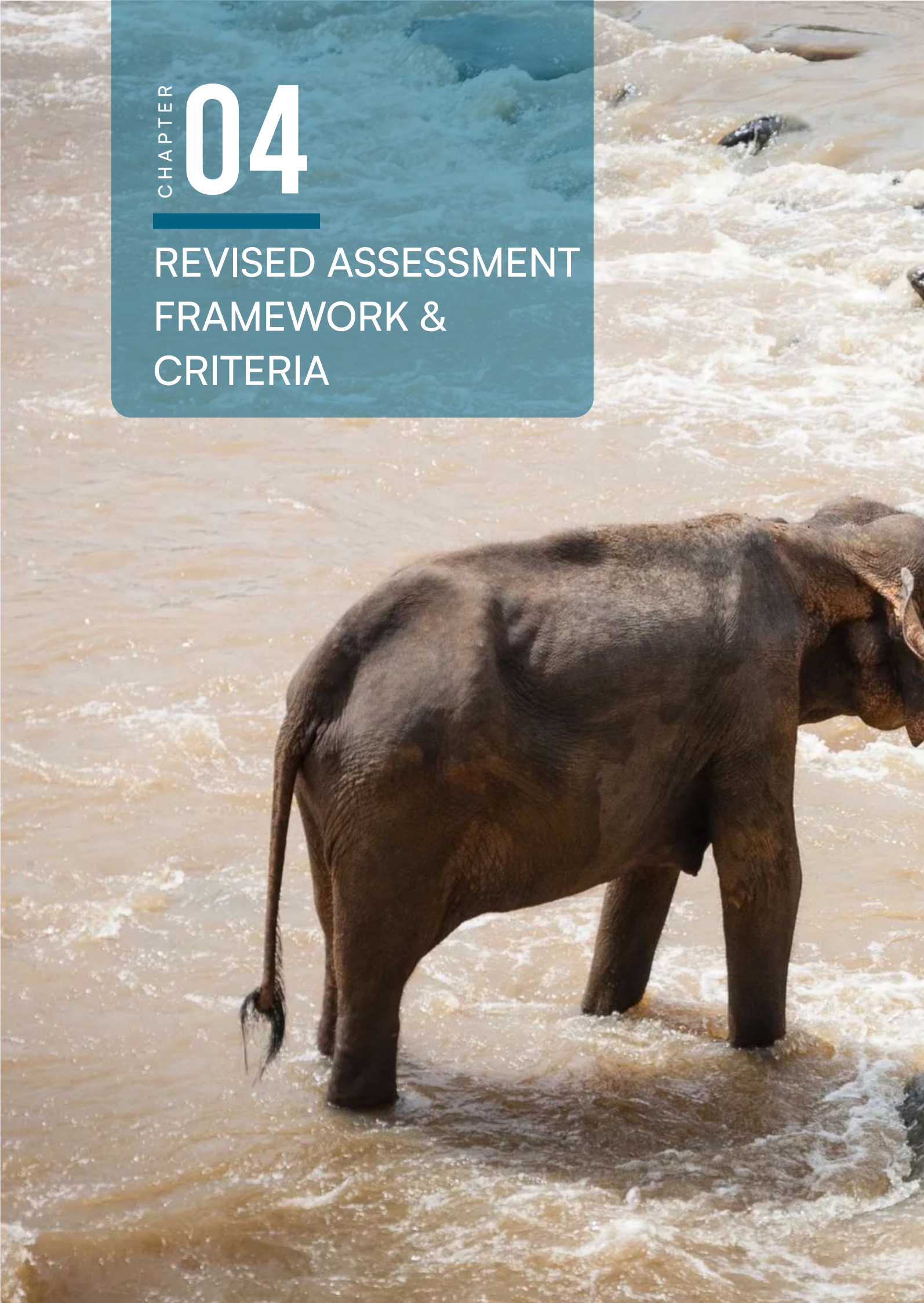
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not show any preparedness to respond to emergencies during disaster situations	Poor (Score 2.5)			
ER show some preparedness to respond to emergencies during disaster situations	Fair (Score 5)			
ER is prepared to respond to most emergencies during Disaster situations	Good (Score 7.5)			
ER is fully prepared to respond to all emergencies during Disaster situations	Very good (Score 10)			
Explanatory note: This assessment takes into account the ER efforts and readiness to meet any emergency situation which includes focus on safety programs based on sound Planning. Prevention, Response and Recovery, and related initiatives, including sufficient equipment, training, practice drills, rapid response teams, mobility and communication, coordination with external agency, command and control etc. Also to be assessed are prevention measures during weather extremes. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (section on disaster management)				

5.8 Does the ER show preparedness to respond to emergencies arising during Human elephant conflict?

Assessment criteria	Rating/Score	(Tick √)	Reference document(s)/ photos	Remarks
ER does not show any preparedness to respond to emergencies arising during HEC	Poor (Score 2.5)			
ER show some preparedness to respond to emergencies during HEC	Fair (Score 5)			
ER is prepared to respond to most emergencies during HEC	Good (Score 7.5)			
ER is fully prepared to respond to all emergencies during HEC	Very good (Score 10)			

Explanatory note: This assessment takes into account the ER efforts and readiness to meet any emergency situation which includes focus on safety programs based on sound Planning. Prevention, Response and Recovery, and related initiatives, including sufficient equipment, training, practice drills, rapid response teams, mobility and communication, coordination with external agency, command and control etc. Also, to be assessed are prevention measures during disease outbreaks.
Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.





CHAPTER 04

REVISED ASSESSMENT FRAMEWORK & CRITERIA

REVISED ASSESSMENT FRAMEWORK & CRITERIA

The overarching objectives of the Revised MEE-ER framework would be:

1. To assess the compatibility between various activities carried out in the ER (under existing plans such as TCP, Working Plan, and Management Plan) and the elephant-specific management needs.
2. To ensure overall preparedness in managing human-elephant conflicts in the interface areas by keeping tab of the trends and underlying processes.
3. To understand landscape-level habitat connectivity through timely identification and demarcation of corridors, and documenting bottlenecks for elephant movement.
4. To gauge if the trends in the elephant population of the ER reflect the envisaged larger conservation needs of the elephants.
5. Considering the nature of the elephant reserves – spread across different management units, the revised evaluation approach shall take care of these nuances.

1. CONTEXTS

CONTEXT				
1.1 Are the values of the ER defined, assessed and documented to secure the LONG-TERM conservation of elephants?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Values are not systematically defined, assessed and documented.	Poor (Score 2.5)			
Values are generally defined, but not systematically assessed and documented.	Fair (Score 5)			
Most values are defined, assessed and systematically documented.	Good (Score 7.5)			
All Values are clearly defined, assessed and systematically formulated and well documented.	Very good (Score 10)			
Explanatory note: Values would include the significance of ERs with respect to Elephant ecology, behavior, seasonal movement and migration. Indicative reference document: 1) Context of declaring area as ER and its present status –Gazette notification and associated documents 2) TCP 3) Management Plan 4) Working plan 5) Other Plans 6) Scientific information (research publication\ reports\ articles).				

CONTEXT				
1.2 Are the threats to the ER IDENTIFIED, assessed and documented in the ER LANDSCAPE?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Threats not systematically identified, assessed and documented.	Poor (Score 2.5)			
Threats are generally identified but not systematically assessed and documented.	Fair (Score 5)			
Most threats are systematically identified, assessed and documented	Good (Score 7.5)			
All threats are systematically identified and assessed and well documented.	Very good (Score 10)			
Explanatory note: This assessment should be based on the number, nature and extent of threats. Threats within and outside the ER should both be considered. Impacts, if any on the population abundance of elephants may be indicated. Elephant-specific prescription in the planning document will indicate the mitigation of threats to the elephants. Indicative Reference document: 1) TCP\Management Plan\Working plan\Other Plans\Scientific information (research publication\ reports\ articles 2) Anthropogenic pressure from villages\human settlement (no. of villages, human and livestock population, illegal removal of bio-mass 3) Developmental projects 4) Status of Invasive species 5) Fire occurrence and vulnerability 6) Water bodies degradation 7) Elephant mortality and reasons.				

CONTEXT				
1.3 Is there inter/intra sectoral coordination between adjoining administrative units across the district and states of the elephant reserve for managing the elephant population?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER lacks well-managed coordination for managing the elephant population.	Poor (Score 2.5)			
ER has some level of coordination for managing the elephant population.	Fair (Score 5)			
ER has good coordination for managing the elephant population.	Good (Score 7.5)			
ER has well-defined and effective coordination for managing the elephant population.	Very good (Score 10)			

Explanatory note: the assessment should take into account the level of coordination between various administrative units including the district level, and other line departments (revenue, panchayat, police, highways, railways, electricity, agriculture and animal husbandry etc. And amongst the states for conservation and management of elephants in the ER landscape.
Indicative reference document: 1) mechanism of coordination prescribed in plans. 2) minutes of the various departmental/interdepartmental coordination meetings 3) frequency of such meetings 4) follow-up actions .

CONTEXT

1.4 Is the ER management able to limit anthropogenic and development pressure?

Assessment criteria	Rating/Score	(Tick √)	Reference document(s)/ photos	Remarks
The ER has extensive human, biotic and development pressure.	Poor (Score 2.5)			
The ER has some human, biotic and development pressure.	Fair (Score 5)			
The ER has little human, biotic and development pressure.	Good (Score 7.5)			
The ER has no human, biotic and development pressure.	Very good (Score 10)			

Explanatory note: This assessment should be based on the existence of human settlements/ villages; livestock grazing, cultivation, encroachments etc., resource extraction/ livelihood dependence of local communities and should reflect the overall interference due to all the above factors. The number and size of human settlements/ enclaved villages and their impacts on the site may be indicated. The extent of development pressure (linear infrastructure, hydro-electric projects, mining and rural/urban development projects close and within ER. The number of development infrastructure projects since the last assessment and the number of mitigation projects /activities implemented since the last assessment must be considered.
Indicative Reference document: 1) TCP\Management Plan\Working plan\Other Plans\Scientific information (research publication\ reports\ articles 2) Anthropogenic pressure from villages\human settlement (number of villages, human and livestock population, illegal removal of bio-mass 3) Developmental projects and compliance of conditions. 4) Status of Invasive species 5) Fire occurrence and vulnerability 6) Water bodies degradation 7) Elephant mortality and reasons.

2. PLANNING

PLANNING				
2.1 Is the ER properly identified and demarcated to achieve the management objectives?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Site not appropriately identified and demarcated.	Poor (Score 2.5)			
Site generally identified but poorly demarcated	Fair (Score 5)			
Site systematically identified but largely.	Good (Score 7.5)			
Site identified, delineated and well-demarcated.	Very good (Score 10)			
Explanatory note: Assessments done for identifying, and delineation of boundaries and demarcation should be considered. The elephant landscape should be identified appropriately to include the ecological contiguity of habitats. The landscape should cover functional habitats for Elephant Conservation, Co-existence and conflict management areas/ hotspots. Indicative Reference document: Gazette notifications, National HWC mitigation strategy and action plan, guidelines for mitigation of HEC, National elephant conservation action plan, Right of Passage and corridor plans, Elephant Reserves of India – An Atlas.				

PLANNING				
2.2 Do the existing plans have strategies (TCP, Management plan, Working plan and Zonal Plans(Eco-sensitive Zones)) to guide and steer the goals of elephant conservation in the reserve?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
The existing plans do not have any strategic guidance to steer and achieve the goals of elephant conservation in the reserve.	Poor (Score 2.5)			
Only a few plans have general strategic guidance to steer and achieve the goals of elephant conservation in the reserve.	Fair (Score 5)			
Many plans have specific strategic guidance to steer and achieve the goals of elephant conservation in the reserve.	Good (Score 7.5)			

All the plans have adequate strategic guidance to steer and achieve the goals of elephant conservation in the reserve.	Very good (Score 10)			
Explanatory note: The existing plans like TCP, Management plan, Working plan should be evaluated for having site-specific strategies for Elephant conservation. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

PLANNING				
2.3 Is the Management Plan (TCP, Management plan, working plan and Zonal Plan) routinely and systematically updated and revised?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
No process in place for systematic review, updating and revision of TCP, Management plan, Working plan and Zonal Plan	Poor (Score 2.5)			
TCP, Management plan, working plan and Zonal Plan are sometimes updated and revised in an ad-hoc manner.	Fair (Score 5)			
TCP, Management plan, working plan and Zonal Plan routinely and systematically updated and revised.	Good (Score 7.5)			
TCP, Management plan, working plan and Zonal Plan routinely, systematically and scientifically updated and revised through a participatory process.	Very good (Score 10)			
Explanatory note: The assessment should take into account the revision/revisiting of the management plans to update or revise information on elephants and other aspects. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

PLANNING				
2.4 Is the institutional planning and monitoring framework of the ERs developed to address the threats in the elephant Reserve?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER lacks a coordinated institutional planning and monitoring framework prescribed in the management and action plan.	Poor (Score 2.5)			
ER has a weak coordinated institutional planning and monitoring framework prescribed in the management and action plan.	Fair (Score 5)			
ER has a partial coordinated institutional planning and monitoring framework prescribed in the management and action plan.	Good (Score 7.5)			
ER has a strong coordinated institutional planning and monitoring framework prescribed in the management and action plan.	Very good (Score 10)			
Explanatory note: This assessment will take into account the institutional setup for monitoring and follow-up actions in the management planning in the ERs. Indicative Framework documents: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. National Elephant Conservation Action Plan, National Strategy and Action Plan for HWC and Elephant Taskforce report (Gajah).				

PLANNING				
2.5 Is the ER integrated into a wider ecological network at the landscape level to include corridors and migration paths for elephant movement?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER not integrated into a wider ecological network/ landscape.	Poor (Score 2.5)			
Some limited attempts to integrate the ER into an ecological network/ landscape.	Fair (Score 5)			

ER is generally quite well integrated into an ecological network/ landscape.	Good (Score 7.5)			
ER is fully integrated into a wider ecological network/ landscape.	Very good (Score 10)			
Explanatory note: Assessment needs to consider the scope of opportunities in the landscape scale that exist for setting a wider ecological network (corridors and migration paths), its identification and protection. What actions are planned/ implemented for their security? Have the TCP, Management plan, Forest Working Plan, Forest Development Corporation plan and Biosphere plans within the identified landscapes taken cognizance of such new requirement? Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan				

PLANNING				
2.6 Does the ER safeguard the threatened biodiversity values, most vital for long term conservation of elephants?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Sites do not safeguard the threatened biodiversity values.	Poor (Score 2.5)			
Sites safeguard a few threatened biodiversity values.	Fair (Score 5)			
Sites safeguard a large number of threatened biodiversity values.	Good (Score 7.5)			
Sites safeguard all threatened biodiversity values.	Very good (Score 10)			
Explanatory note: This assessment takes into account the biodiversity values specially those impacting elephant conservation and management and safeguards in place to mitigate threats. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

PLANNING				
2.7 Are stakeholders including communities given an opportunity to participate in planning?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Little, if any opportunity for stakeholder participation in planning.	Poor (Score 2.5)			

Stakeholders participate in some planning.	Fair (Score 5)			
Stakeholders participate in most planning processes.	Good (Score 7.5)			
Stakeholders routinely and systematically participate in all planning processes.	Very good (Score 10)			
Explanatory note: This assessment should take into account the participation of stakeholders in planning and continuous interaction, dissemination and sharing of information. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

PLANNING				
2.8 Are habitat management programmes systematically planned and monitored?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Habitat restoration programmes are entirely ad-hoc.	Poor (Score 2.5)			
Habitat Restoration programmes have limited planning and monitoring inputs	Fair (Score 5)			
Habitat restoration programmes are generally well-planned and monitored.	Good (Score 7.5)			
Habitat restoration programmes are scientifically planned and monitored.	Very good (Score 10)			
Explanatory note: This assessment should be primarily based on habitat management programmes for amelioration of the habitats of elephants Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

PLANNING				
2.9 Does the ER have an adequate protection strategy?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not have any protection strategy.	Poor (Score 2.5)			
ER has a minimal and ad-hoc protection strategy.	Fair (Score 5)			

ER has a well-drawn but not pragmatic protection strategy	Good (Score 7.5)			
ER has a comprehensive and effective protection strategy.	Very good (Score 10)			

Explanatory note: This assessment takes inter-alia into account the extent and nature of threats, and plans to address such threats by setting up an adequate number of patrolling camps in vulnerable areas, organizing foot and mobile patrolling, with sufficient available manpower, supported by equipment, infrastructure and firearms. Besides this, the nature of the terrain, levels of difficulties, practicability of area coverage, and readiness to contain specific threats with necessary support and facilities should be considered. The coordination with other wings of the Forest Department/ Police/ Customs etc and its effectiveness needs to be assessed.
Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.

PLANNING

2.10 Does the ER have an action plan for management (including compensation for Loss) of human-elephant conflicts?

Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not have any strategy/action plan for the management of conflict.	Poor (Score 2.5)			
ER has a minimal and ad-hoc strategy/action plan for the management of conflict.	Fair (Score 5)			
ER has a general strategy/ action plan for the management of conflict.	Good (Score 7.5)			
ER has a comprehensive and effective strategy/action plan for the management of conflict.	Very good (Score 10)			

Explanatory note: This assessment takes inter-alia into account the extent and nature of HEC, and plans to address such threats by setting up an adequate number of Anti depredation squads (primary Response team/rapid response team/community-based response teams) in vulnerable areas, organizing foot and mobile patrolling, with sufficient available manpower, supported by equipment, infrastructure and fire arms. The coordination with other wings of the Forest Department/ Police/ Customs etc. and setting up of coordination committee at District and state level and its effectiveness needs to be assessed. Further to be considered are the crop choices in the adjoining agricultural landscape/ ESZ & control over indiscriminate electrical/ solar fencing in the farmland and mitigation measures envisaged including preventive measures/deterrents and compensation mechanism for loss of life, injury and damage to property, crop insurance and community based eco-development activities.
Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. National HWC mitigation strategy and action plan, guidelines for mitigation of HEC, National elephant conservation action plan and corridor plans

3. INPUT

INPUT				
3.1 Are personnel adequate, well-organised and deployed with access to adequate resources in the ER?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Few, if any, personnel are explicitly allocated for ER management.	Poor (Score 2.5)			
Some personnel are explicitly allocated for ER management but not well organized with minimal resources and not linked to meet management objectives.	Fair (Score 5)			
Many personnel are explicitly allocated and well organized with optimum resources, linked to meet substantial management objectives.	Good (Score 7.5)			
Adequate personnel is explicitly allocated and fully organized with adequate to meet all management objectives.	Very good (Score 10)			
Explanatory note: The assessment should take into account the staff requirement of the ER and its deployment, their qualification, and administrative and financial powers. The evaluator should look at whether the Staff deployed are permanent or contractual and deployed as per planning norms (TCP, Management plan, Working plan), access to computers, internet, digital devices for execution of daily duties, communication and updation of knowledge. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

INPUT				
3.2 Are resources (communication, equipment, infrastructure etc.) adequate, well distributed and managed with desired access?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Few, if any, resources are explicitly allocated for ER management.	Poor (Score 2.5)			
Some resources are explicitly allocated for ER management but not systematically linked to management objectives.	Fair (Score 5)			

Some resources are explicitly allocated towards the achievement of specific ER management objectives.	Good (Score 7.5)			
Adequate resources explicitly allocated towards the achievement of specific ER management objectives.	Very good (Score 10)			
Explanatory note: This assessment should take into account the resources required for communication (wireless, vehicles etc), equipment (Surveillance equipment, GPS, Firearms ammunition, disaster management equipment etc) and infrastructure support including road network, anti-poaching camps, check posts and barriers etc envisaged in the plans and those existing and their regular maintenance as per prescribed schedule. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. Stores, building and maintenance registers				

INPUT				
3.3 Are financial resources both State and central linked to priority actions and are funds adequate, released timely and utilized?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Resource allocation is adhoc, funds are inadequate, seldom released in time and not utilized. Unable to raise additional funds.	Poor (Score 2.5)			
Some specific allocation for management of priority action. Funds are inadequate and there is some delay in release, partially utilized. Some funds were raised additionally and utilized.	Fair (Score 5)			
Comprehensive planning and allocation that meets the most important objectives. Generally, funds are released with not much delay and are mostly utilized. Substantial funds were raised additionally and utilized.	Good (Score 7.5)			
Comprehensive planning and allocation of resources for attainment of most objectives. Funds are generally released on time and are fully utilized. Adequate funds raised additionally and utilized.	Very good (Score 10)			

Explanatory note: Obtain details of funds released by the State and MoEF to meet the budgetary requirement and their utilization by ER in the last 3 years. Also, comment on the problems associated with funds and their mitigation.
Indicative Reference Document: Annual Plan of Operation, Budget allocation, MOU with Companies under CSR, MOU with other donors. Budgetary allocation forecast in TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.

INPUT				
3.4 Does the ER have adequate manpower and other resources to carry out enforcement actions?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
The ER has a weak enforcement system, manpower, and infrastructure support to protect the ER.	Poor (Score 2.5)			
The ER has an ad-hoc enforcement system with limited manpower and infrastructure support to protect the ER.	Fair (Score 5)			
The ER has a well-planned enforcement system with adequate manpower, and infrastructure support but poorly monitored to protect the ER.	Good (Score 7.5)			
The ER has a well-planned and strong enforcement system with adequate manpower, infrastructure support and well-monitored to protect the ER.	Very good (Score 10)			
Explanatory note: This assessment takes into account the enforcement mechanism with strong legal backing to control elephant poaching with adequate manpower and resources for prosecution. The number of poaching cases detected and action taken for investigation, documentation and follow-up in courts and their pendency needs to be considered. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan and Wildlife crime investigation and prosecution data.				

INPUT				
3.5 What level of resources is provided by civil society organizations?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
CSOs contribute nothing to the management of the site.	Poor (Score 2.5)			
CSOs make some contribution to the management of the site but opportunities for collaboration are not systematically explored.	Fair (Score 5)			
CSOs contributions are systematically sought and negotiated for the management of some site-level activities.	Good (Score 7.5)			
CSOs contributions are systematically sought and negotiated for the management of many site-level activities.	Very good (Score 10)			
Explanatory note: Details of contributions (cash/kind) made by the CSOs(NGO, CSR, university, institutes etc) in the last 3 years may be collected. Indicative Reference Document: MOU with Companies under CSR, MOU with other donors.				

4. PROCESS

PROCESS				
4.1 Does the management units of ER have trained manpower resources for effective management?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Very few trained officers and frontline staff in the ER.	Poor (Score 2.5)			
Few trained officers and frontline staff, are posted in the ER.	Fair (Score 5)			
A large number of trained officers and frontline staff are posted in the ER.	Good (Score 7.5)			
All trained managers and frontline staff posted in the ER .	Very good (Score 10)			

Explanatory note: The training imparted to staff in various categories including basic, specialized and advanced training followed by refresher training needs to be considered. The percentage of trained staff in various categories. i.e. Higher Management: ACF/ DCF/ CF/ CCF; Frontline Staff: Range Officer; Beat Officer; Forest Guard; Casual Daily Labour (CDL) Veterinary staff, mahawats and cavadies and Others will indicate the adequacy of the capacity building in the organization.
Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. Training needs assessment Plan and MOU for training with reputed institute.

PROCESS				
4.2 Does the staff performance of management units of ER, linked to achievement of management objectives?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
No linkage between staff performance management and management objectives.	Poor (Score 2.5)			
Some linkage between staff performance management and management objectives, but not consistently or systematically assessed.	Fair (Score 5)			
Performance management for most staff is directly linked to the achievement of relevant management objectives.	Good (Score 7.5)			
Performance management of all staff is directly linked to the achievement of relevant management objectives.	Very good (Score 10)			
Explanatory note: The work plan drawn for individuals and performance assessment based on the criteria is to be considered. Reward/ appreciation for any outstanding performance in the last 3 years? Indicative Reference Document: Work Plan document, GO on grant of awards/rewards to staff. Annual Appraisal documents				

PROCESS				
4.3 Does the ER encourage stakeholder's participation in Management activities?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Little or no public participation in ER management.	Poor (Score 2.5)			

Opportunistic public participation in some of the relevant aspects of ER management.	Fair (Score 5)			
Systematic public participation in most of the relevant aspects of ER management.	Good (Score 7.5)			
Comprehensive and systematic public participation in all important and relevant aspects of ER management.	Very good (Score 10)			
Explanatory note: The stakeholders are a large section of people including personnel, school and college students, teachers and professors, corporate employees, caterers, transport operators, media representatives, naturalists and general enthusiasts who volunteer to participate in management activities. Their participation in ER management is to be considered. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (reference on the involvement of stakeholders).				

PROCESS				
4.4 Is the ER conducting veterinary surveillance and monitoring disease in the landscape?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
The ER does not have access to and networking with veterinary institutions and support staff for conducting follow-up preventive medicine protocol, disease surveillance, and control of infectious disease screening and has no medical records.	Poor (Score 2.5)			
The ER has limited access to and networking with veterinary institutions and has less support staff for conducting few preventive medicine protocols, and disease surveillance control of infectious disease screening but lacks in the maintenance of medical records.	Fair (Score 5)			

The ER has substantial access to and networking with the veterinary institution and has full support staff for conducting adequate preventive medicine protocol, disease surveillance control of infectious disease screening and has maintained few medical records.	Good (Score 7.5)			
The ER has full access to and networking with veterinary institutions and has all support staff for comprehensive preventive medical protocol, disease surveillance control of infectious disease screening and maintains medical records systematically.	Very good (Score 10)			
Explanatory note: This assessment takes into account the adherence to preventive medicine protocols including surveillance procedure and control, infectious disease screening and maintenance of medical records. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (prescription on disease management and control).				

PROCESS				
4.5 Is there a responsive system for handling complaints and comments about ER management?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
No systematic approach to handling complaints.	Poor (Score 2.5)			
Complaints handling system operational but not responsive to individual issues and limited follow-up provided.	Fair (Score 5)			
Coordinated system logs and responds effectively to most complaints.	Good (Score 7.5)			
All complaints systematically logged in coordinated system and timely responses are provided with minimal repeat complaints.	Very good (Score 10)			

Explanatory note: The maintenance of the complaint register, action on petitions and complaints and opportunity for recording feedback, number of queries made and response thereof under the Right to Information (RTI), Act in the last 3 years may be considered.
Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (prescription on complaint redressal) GO on complaint registration and action.

PROCESS				
4.6 Does ER management address the livelihood issues of resource-dependent communities?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
No livelihood issues are addressed by ER management.	Poor (Score 2.5)			
Few livelihood issues are addressed by ER management.	Fair (Score 5)			
Substantial livelihood issues are addressed by ER management.	Good (Score 7.5)			
Livelihood issues of resource-dependent communities especially women are addressed effectively by ER managers.	Very good (Score 10)			
Explanatory note: The JFM and Eco-development initiatives under State/ Central schemes and their implementation especially those related to livelihood issues in the ER are to be examined. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (reference to JFM and eco-development).				

PROCESS				
4.7 Does the ER have a captive facility for orphan and conflict elephant populations?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not have any captive elephant management facility.	Poor (Score 2.5)			
ER does have a basic captive elephant management facility without veterinary support and equipment.	Fair (Score 5)			

ER does have a captive elephant management facility with equipment and veterinary support.	Good (Score 7.5)			
ER does have an adequate captive elephant management facility with equipment, veterinary support and a transport facility.	Very good (Score 10)			
Explanatory note: This assessment will take into account rescue and rehabilitation facility, veterinary support and equipment including kraal and enrichment. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (reference to HWC and captive facility).				

PROCESS				
4.8 Does the ER use innovative techniques/ technologies for management (conservation, education, research, rescue and rehabilitation) efforts?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not use any special technology for any sphere of management.	Poor (Score 2.5)			
ER uses technological innovation in a few spheres of management.	Fair (Score 5)			
ER uses technological innovation in most spheres of management.	Good (Score 7.5)			
ER uses technological innovation in all spheres of management.	Very good (Score 10)			
Explanatory note: The assessment should take into account the smart applications for tracking and monitoring elephants, surveillance and enforcement against poachers, fire mapping and habitat evaluation and management. Use of drones and UAVs, visitor-friendly interpretation and education smart applications(touch screen kiosks and 3D shows etc). Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (reference on the use of technology).				

PROCESS				
4.9 Does the ER have the necessary support structure for management (including timely compensation for loss) of Human-Elephant conflict?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Human-elephant conflicts are rampant with no support infrastructure.	Poor (Score 2.5)			
ER has been able to mitigate few human-wildlife conflicts and has basic/little support infrastructure.	Fair (Score 5)			
ER has been able to mitigate many human-wildlife conflicts and has sufficient support infrastructure.	Good (Score 7.5)			
ER has been able to comprehensively mitigate human-wildlife conflicts and have adequate support infrastructure.	Very good (Score 10)			
Explanatory note: The assessment should take into account the mitigation of Human-Elephant conflict based on sound planning and availability of human resources, infrastructure and support including compensation for crop damage, injury and death of humans. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan (Reference to HWC and captive facility).				

PROCESS				
4.10 Does the ER manage the water resources including wetlands appropriately?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER manages the water resources in an ad-hoc manner.	Poor (Score 2.5)			
ER manages the water resources in a sub-optimal/ limited manner.	Fair (Score 5)			
ER manages the water resources in an optimal and planned manner.	Good (Score 7.5)			
ER manages the water resources in the most optimal and sustainable manner.	Very good (Score 10)			

Explanatory note: The assessment should take into account the hydrology of the tract, management of wetlands, the distribution of water holes, recharging of aquifers and artificial rejuvenation during the lean season. Use of innovative technology for the conservation of water. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan (Reference on water management).

5. OUTPUT

OUTPUT				
5.1 Is adequate information on ER management publicly available?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Little or no information on ER management is publicly available.	Poor (Score 2.5)			
Publicly available information is general and has limited relevance to management accountability and the condition of public assets.	Fair (Score 5)			
Publicly available information provides detailed insight into major management issues for ER.	Good (Score 7.5)			
Comprehensive reports are routinely provided on the management and condition of public assets in ER.	Very good (Score 10)			
Explanatory note: The availability of websites and use of print and social media for dissemination of information and its management with respect to the comprehensiveness of information, and its periodical updation is to be considered. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (reference to Education and dissemination of information).				

OUTPUT				
5.2 Are visitor services (tourism and interpretation) and facilities appropriate and adequate?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Visitor services and facilities are ad-hoc and/or threaten ER values.	Poor (Score 2.5)			

Visitor services and facilities are limited and do not threaten ER values.	Fair (Score 5)			
All visitor services and facilities are generally adequate and most enhance ER values.	Good (Score 7.5)			
All visitor services and facilities are comprehensive, and adequate and enhance ER values.	Very good (Score 10)			
Explanatory note: Include the existence and quality of visitor and interpretation centres, including skills and capabilities of personnel manning these, site-related publications, films, and videos; arrangements of stay (including places serving refreshments and food owned and managed by site), watch towers and hides including safety factors, vehicles assigned for visitors including riding elephants if any and their deployment, drinking water, restrooms, garbage disposal, attended and self-guided services in the field, visitor feedback on the quality of wilderness experience. Details of numbers of visitors/ tourists(both domestic and overseas) coming in the last 3 years and the revenue earned may be assessed. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (reference to visitor management).				

OUTPUT				
5.3 Are research/monitoring-related trends systematically evaluated, routinely reported and used to improve management?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Little or no systematic evaluation or routine reporting of trends.	Poor (Score 2.5)			
Some evaluation and reporting were undertaken but neither systematic nor routine.	Fair (Score 5)			
Systematic evaluation and routine reporting of management-related trends undertaken.	Good (Score 7.5)			
Systematic evaluation and comprehensive reporting of trends undertaken and attempts made, course corrections as relevant.	Very good (Score 10)			

Explanatory note: Not all sites attract projects and researchers and with exceptions, little research takes place on the site's own steam because of systemic limitations. However, monitoring of some critical issues is expected e.g. the population of Elephants and carnivores with insights into their demography and distribution (some opportunistic sampling by sightings, signs and spatial distribution during assessment would be extremely useful in terms of expert impression and as a pulse), monitoring the incidence of livestock grazing, fires, weeds, sources of water, a variety of illegal activities typically associated with the reserve, wildlife health (e.g. epidemics, immunization of livestock) regeneration and change in vegetation, visitors and their activities, offence cases, ex-gratia payments etc. Details of the number of research projects in the last 3 years, institutions involved and salient outcomes may be collected and used in awarding scores.
Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (section on research).

OUTPUT

5.4 Is there a systematic maintenance schedule and funds in place for management of infrastructure/assets?

Assessment criteria	Rating/Score	(Tick √)	Reference document(s)/ photos	Remarks
No systematic inventory or maintenance schedule.	Poor (Score 2.5)			
Inventory maintenance is ad-hoc and so is the maintenance schedule.	Fair (Score 5)			
Systematic inventory provides the basis for maintenance schedule but funds are inadequately made available.	Good (Score 7.5)			
Systematic inventory provides the basis for maintenance schedule and adequate funds are made available.	Very good (Score 10)			

Explanatory note: The Forest code, advisories and circulars on inventory and maintenance schedules should be examined and its implementation and data records are to be assessed. Further, the funds allocated and spent (Plan and Non-Plan) for maintenance in the last three years should be considered.
Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (section on inventory of equipment and infrastructure and maintenance).

OUTPUT				
5.5 Is the habitat management programme executed, monitored, and evaluated as planned?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Little or no systematic monitoring and evaluation and not executed as scheduled/ planned.	Poor (Score 2.5)			
Some evaluation and reporting were undertaken but executed in an ad-hoc manner and did not achieve the schedule/planned objectives.	Fair (Score 5)			
Systematic evaluation and routine follow-up but execution meets some of the schedules/ planned objectives.	Good (Score 7.5)			
Systematic evaluation and comprehensive follow-up undertaken and schedules/ planned objectives adequately achieved.	Very good (Score 10)			
Explanatory note: This assessment takes into account the habitat amelioration works (ecological restoration of degraded areas, rejuvenating water bodies and eradication of weeds) and their monitoring following State and Moef & CC guidelines. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (section on habitat management).				

OUTPUT				
5.6 Is the fire management program executed, monitored, and evaluated as per protocol?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Little or no systematic monitoring and evaluation and not executed as scheduled/ planned.	Poor (Score 2.5)			
Some evaluation and reporting were undertaken but executed in an ad-hoc manner and did not achieve the schedule/planned objectives.	Fair (Score 5)			

Systematic evaluation and routine follow-up but execution meets some of the schedules/ planned objectives.	Good (Score 7.5)			
Systematic evaluation and comprehensive follow-up undertaken and schedules/ planned objectives adequately achieved.	Very good (Score 10)			
Explanatory note: This assessment takes into account the fire management planning, extent and occurrence of fire in the landscape its mapping and monitoring. The fire management protocols including audits and readiness to respond should be considered. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.and Biosphere reserve plan. (section on fire management).				

OUTPUT				
5.7 Does the ER show preparedness to respond to emergencies arising during the occurrence of fires, floods and natural disasters?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not show any preparedness to respond to emergencies during disaster situations.	Poor (Score 2.5)			
ER show some preparedness to respond to emergencies during disaster situations.	Fair (Score 5)			
ER is prepared to respond to most emergencies during Disaster situations.	Good (Score 7.5)			
ER is fully prepared to respond to all emergencies during Disaster situations.	Very good (Score 10)			
Explanatory note: This assessment takes into account the ER efforts and readiness to meet any emergency situation which includes a focus on safety programs based on sound Planning. Prevention, Response and Recovery, and related initiatives, including sufficient equipment, training, practice drills, rapid response teams, mobility and communication, coordination with external agencies, command and control etc. Also to be assessed are prevention measures during disease outbreaks and weather extremes. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (section on disaster management).				

OUTPUT				
5.8 Does the ER show preparedness to respond to emergencies arising during Human-elephant conflict?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not show any preparedness to respond to emergencies arising during HEC.	Poor (Score 2.5)			
ER shows some preparedness to respond to emergencies during HEC.	Fair (Score 5)			
ER is prepared to respond to most emergencies during HEC.	Good (Score 7.5)			
ER is fully prepared to respond to all emergencies during HEC.	Very good (Score 10)			
Explanatory note: This assessment takes into account the ER efforts and readiness to meet any emergency situation which includes a focus on safety programs based on sound Planning. Prevention, Response and Recovery, and related initiatives, including sufficient equipment, training, practice drills, rapid response teams, mobility and communication, coordination with external agencies, command and control etc. Also, to be assessed are prevention measures during disease outbreaks. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan.				

6. OUTCOMES

OUTCOMES				
6.1 Are populations of elephants declining, stable or increasing?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Elephant population declining.	Poor (Score 2.5)			
Elephant populations stable.	Fair (Score 5)			
Elephant populations increasing.	Good (Score 7.5)			
The elephant population increasing and demography known.	Very good (Score 10)			

Explanatory note:* This assessment should take into account the population dynamics of various clans in the ER and changes observed in the number of calves born and survived, healthy age gradation and adult sex ratio, breeding females, mortality and presence of tuskers in the population. The population trends over the years and its dynamics is to be considered. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (section on population estimation and monitoring), All India Synchronized Elephant census report – XXXX, 2012, 2017 State elephant population estimation, research papers and articles.

OUTCOMES				
6.2 Has the ER been able to manage the Human Elephant conflict?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
HEC has not reduced over the years but has enhanced due to poor mitigation measures.	Poor (Score 2.5)			
HEC has slightly decreased due to ad-hoc mitigation measures.	Fair (Score 5)			
HEC has sufficiently decreased due to better mitigation measures.	Good (Score 7.5)			
HEC has been effectively contained due to efficient mitigation measures.	Very good (Score 10)			
Explanatory note: This assessment takes into account the actions taken in the elephant reserves for the reduction/minimization of elephant conflict. The nature, extent and mitigation of the conflict reported in ER (no. of incidents, the extent of damage, effectiveness of barriers, loss of lives and injuries to humans and damage to property and crops, mortality of elephants and retaliatory killings. Indicative Reference Document: HWC monitoring reports, Mortality of Animals, Compensation paid				

OUTCOMES				
6.3 Have the threats to the ER due to poaching, habitat degradation (weeds, fire, fragmentation etc) and infrastructure development pressures been reduced/ minimized?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Threats to the ER have not abated but have enhanced.	Poor (Score 2.5)			
Some threats to the ER have abated.	Fair (Score 5)			

Most threats to the ER have abated. The few remaining are vigorously being addressed.	Good (Score 7.5)			
All threats to the ER have been effectively contained.	Very good (Score 10)			
Explanatory note: This assessment takes, into account the occurrence of threats related to poaching, habitat degradation (weeds, fire and fragmentation), infrastructure development projects, and mining. Indicative Reference Document: Data on poaching, mortality of animals, habitat destruction and occurrence of weeds and water stress, development of infrastructure and mining - undermining biodiversity conservation.				

OUTCOMES				
6.4 Does the ER address the organization's goals for human resource development?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Does not provide any opportunity for capacity building and training, developing leadership, assured career progression and raising the skill and motivation levels of Staff.	Poor (Score 2.5)			
Provides some opportunity for capacity building and training, developing leadership, assured career progression and raising skill and motivation levels of Staff.	Fair (Score 5)			
Provides adequate opportunity for capacity building and training, developing leadership, assured career progression and raising skill and motivation levels of Staff.	Good (Score 7.5)			
Provides all opportunities for capacity building and training, developing leadership, assured career progression and raising skill and motivation levels of Staff and addressing welfare issues.	Very good (Score 10)			
Explanatory note: The assessment should take into account the management initiatives towards providing an environment for leadership, development of skills and raising confidence and motivational levels of Staff and addressing welfare issues pertaining to career progression, social welfare etc. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (section on HRD), Reports on staff welfare measures and grant of rewards/awards to staff.				

OUTCOMES				
6.5 Does the ER education and awareness programme enhance the visitor-learning experience?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not provide learning opportunities to inspire and generate awareness through education programs interactive displays and interpretation centres, distribution of publications and extension activities.	Poor (Score 2.5)			
ER provides some learning opportunities to inspire and generate awareness through education programs interactive displays and interpretation centres, distribution of publications and extension activities.	Fair (Score 5)			
ER provides adequate learning opportunities to inspire and generate awareness through education programs, interactive displays and interpretation centres, distribution of publications and extension activities.	Good (Score 7.5)			
ER provides full learning opportunities to inspire and generate awareness through education programs interactive displays and interpretation centres, distribution of publications and extension activities.	Very good (Score 10)			
Explanatory note: This assessment takes into account the visitor learning experience and meeting their expectation through the number of educational programmes, guided tours, illustrated species talks, visits to interactive displays and interpretation centre, literature provided at the entrance and in-house education program and extension activities and distribution of resource material for education, use of the website and visitor feedback mechanism. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (section on Education and visitor management and its implementation).				

OUTCOMES				
6.6 Are local communities supportive of ER management?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
Local communities are hostile.	Poor (Score 2.5)			
Some are supportive.	Fair (Score 5)			
Most locals are supportive of ER management.	Good (Score 7.5)			
All local communities are supportive of ER management.	Very good (Score 10)			
Explanatory note: This assessment should take into account the coordination, interaction and support from the local communities and actions and activities taken under JFM/ eco-development programmes to enlist their support. The reason for the disenchantment of communities due to managerial neglect or low managerial efforts should be identified and any action taken for restoration/confidence-building measures should be considered. The inputs provided by NGOs towards garnering their support is also relevant. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (section on JFM and ecodevelopments) Evaluation Report on JFM and Ecodevelopment initiatives.				

OUTCOMES				
6.7 Are research outcomes relevant and support conservation?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not have a research plan and has not participated, or supported any research study and has not assimilated any research findings in the management of ER.	Poor (Score 2.5)			
ER does not have a research plan and has participated, and supported a few research studies but not assimilated the findings in the management of ER.	Fair (Score 5)			

ER has a research plan and has participated and supported in many research studies but has not assimilated the findings in the management of ER.	Good (Score 7.5)			
ER has a comprehensive research plan and has participated and supported in many research studies and assimilated the findings in the management of ER	Very good (Score 10)			
Explanatory note: This assessment takes into account the research studies conducted on relevant and priority topics as per the plan, and assimilated the research findings in the management of ER. Indicative Reference Document: TCP, Management plan, Working plan, Zonal plan, Forest corporation management plan and Biosphere reserve plan. (Section on research), Report/ Articles/Documents on research in the landscape.				

OUTCOMES				
6.8 Does the ER consciously manage activities adapting to Climate Change and disaster risk reduction?				
Assessment criteria	**Rating/Score**	**(Tick √)**	**Reference document(s)/ photos**	**Remarks**
ER does not make any effort to manage activities adapting to climate change.	Poor (Score 2.5)			
ER has made an effort to manage a few activities adapting to climate change.	Fair (Score 5)			
ER has made an effort to manage many activities adapting to climate change.	Good (Score 7.5)			
ER has made an effort to manage most activities adapting to climate change.	Very good (Score 10)			
Explanatory note: The assessment should take into account efforts in habitat amelioration works, sustainable use of energy, water supply and waste management, eco-friendly travel and transport, procurement by sourcing local products and other innovative mechanisms to reduce carbon footprint. Indicative Reference Document: Research Reports/Articles/ Papers/ Thesis/Dissertation/ Newspaper articles on climate change in the landscape.				

SCORECARD

Framework Element Number	Framework Element Name	Number of Questions (a)	Maximum Mark per question (b)	Total (a x b)	Marks obtained for the Element	Overall Score
1.	Context	04	10	40		Marks obtained/ Total Marksx100 = %
2.	Planning	10	10	100		
3.	Inputs	05	10	50		
4.	Process	10	10	100		
5.	Outputs	08	10	80		
6.	Outcomes	08	10	80		
TOTAL		45		450		

CHAPTER 05

CONCLUSION & WAY FORWARD

CONCLUSION & WAY FORWARD

The evaluation of management effectiveness in the Elephant Reserve has provided valuable insights into the present situation of conservation efforts. The intricacies surrounding the protection and conservation of elephant habitats and the mitigation of human-elephant conflicts emphasize the importance of a well-executed and adaptive management strategy. While significant measures have been made, challenges persist, necessitating a comprehensive and proactive approach to enhance the overall effectiveness of elephant reserve management.

Moving forward, the following measures are recommended to enhance the management effectiveness of the Elephant Reserve.

1. The pilot of the MEE of the 4 ERs has been successfully validated with the envisaged 44 criteria relevant and appropriately evaluated with the evidence gathered from the reference documents as well as ground-truthing.

2. The MEE has highlighted the critical importance of robust conservation policies, community engagement, and adaptive management practices. Various innovative sustainable management practices were adopted by the field units in the various ERs, which could be further enhanced by the landscape approach to ER management.

3. Based on the pilot and after discussion with the field officers, the appropriateness of different criteria and indicators have been examined and certain modifications have been incorporated in the MEE format.

4. The pilot also refined the evaluation methodology for elephant reserves in the absence of the Elephant Conservation Plan (ECP) by adopting the weighted average considering both elephant number and area of elephant habitat. This method is to be followed till the preparation of ECP for the respective Elephant Reserve. It may also continue as a baseline indicator for successive evaluations.

5. The management outcome in the form of management strengths, management weaknesses and immediate actionable points have been documented which will provide valuable understanding for future management interventions.

6. The next logical step after the pilot is to conduct MEE of the balance Elephant Reserves.

7. The cycle of MEE of all the elephant reserves has to be at every 4 years duration.

By implementing these measures, the Elephant Reserve can move towards a more effective and sustainable management paradigm. This holistic approach seeks to balance conservation priorities with the needs of local communities, ensuring the long-term viability of the Elephant Reserve and the well-being of its diverse ecosystems.

ANNEXURE’S

ANNEXURE I

MANAGEMENT STRENGTHS, WEAKNESSES AND ACTIONABLE POINTS FOR KAZIRANGA-KARBI ANGLONG ER, ASSAM, NORTH-EASTERN REGION

Introduction: About the Elephant Reserve

The Kaziranga- Karbi Anglong Elephant Reserve in Assam, India, is a critical area for Asian elephant conservation. Assam is home to about 5,700 elephants, and this reserve covers a substantial portion of the state's forests. While some of these forests are protected as National Parks and Wildlife Sanctuaries (5 PAs), most are different types of forests (41 RFs) inhabited by various wildlife, including elephants.

The Kaziranga- Karbi Anglong Elephant Reserve was notified on 17th April 2003 and includes: -

1-Eastern Assam Wildlife Division (1092 elephants)
2-Golaghat Forest division (54 elephants)
3-KarbiAnglong east Forest division (376 elephants)
4-Nagaon Forest division and
5-Nagaon South,Hojai Forest division
6-Biswanath Forest division (after notifying the Northern range as Biswanath ghat of EAWL Division as division)

The ER includes Golaghat, Bokakhat, Bokajan, Diphu, Hojai, Kaliabore, Nagaon, Biswanath Charali and Tezpur Subdivision of Golaghat, Karbi Anglong, Nagaon, Sonitpur and Biswanath districts. It covers approximately 3,270 km^2. It is a significant stronghold for Asian elephants, with over 2,000 of these majestic animals living in the region. This reserve is unique due to its diverse ecosystems, including grasslands, forests, and human-inhabited areas.

Having received awards for "best teamwork during emergencies (1998)," "best managed Tiger plan (1999)," and "best managed Tiger Reserve for anti-poaching activities during 3rd Ministerial Conference (2016)," Kaziranga National Park and Tiger Reserve, which is a World Natural Heritage site (1985), CA/TS site (2021), and have mosaic of vast grassland, wetland, and compact woodland suitable for Elephant, act as core zone of this Elephant Reserve, and is home to more than one thousand wild elephants ensuring long term survival of this population.

This ER is situated between the Kaziranga National Park and the Karbi Anglong Hills, creating a vital corridor for elephant movement. The Kaziranga National Park is located in the floodplains of the Brahmaputra River, and during the flood season, the survival of wildlife depends on access to the hilly regions of the landscape.

The reserve consists of various forest types, including tropical evergreen, semi-evergreen, and moist deciduous forests. The Brahmaputra and its tributaries, notably the Dhansiri and Diffolu rivers, cut through it, providing water for both plant and wildlife, including elephants.

The elephant population in the reserve is distributed across different Forest Divisions, allowing for better management. Elephants in this region often migrate through corridors between these Forest Divisions. At times these movements can lead to conflicts with human settlements, agriculture and Tea Gardens. Tea gardens, which are prevalent in Assam, attract elephants due to water and food availability. These gardens are interspersed with natural habitats, creating opportunities for conflicts.

The Kaziranga-Karbi Anglong Elephant Reserve faces a number of issues despite its significance, including habitat loss brought on by forest degradation, human encroachment, poaching, and conflicts between humans and elephants. The reserve is situated in a part of the landscape that has been significantly altered by human activity, including infrastructural development and agriculture. Elephant and human conflicts are exacerbated by the nearby areas' dense populations.

The protection of elephant corridors, educating the local population, and reducing human-elephant conflicts are all continuing conservation activities. The reserve is also establishing eco-sensitive zones to safeguard wildlife corridors.Elephant deaths from numerous reasons, such as train accidents, poisoning, and electrocution, have raised concerns recently. Through awareness campaigns and preventative measures, efforts are being undertaken to address these challenges.

Elephant mobility is made easier and genetic diversity is maintained by preserving elephant corridors. In a notification dated April 1st 2022, the Assam government announced nine ⑨ corridors - 1. Panbari. 2. Haldibari, 3. Bagori, 4. Harmoti, 5. Kanchanjuri, 6. Hatidandi, 7. Deosur, 8. Chirang and 9. Amguri. These corridors were identified, delineated, and recognized as "Functional Corridors" and "Structural Corridors" with the appropriate provisions. These corridors transverse a variety of landscapes, including forests, human settlements, agricultural land, and tea gardens.

In contrast to rhinos, elephants appear to roam across great distances and do not appear to be solely residents of Kaziranga. Although elephants in Kaziranga National Park are quite protected, they nevertheless run the chance of dying outside the NP. Therefore, elephant management must be viewed as a single unit of management with very high level protection measures, at least inside the Kaziranga- Karbi Anglong ER (KKAER), and in the context of a bigger landscape perspective.

The Kaziranga-Karbi Anglong Elephant Reserve is an essential location for Asian elephant conservation, but it faces a number of difficulties that call for coordinated efforts in order to guarantee the survival of these majestic animals and promote harmony between local wildlife and humans.

MANAGEMENT STRENGTHS

1. The elephant landscape between Kaziranga and Karbi Anglong is extremely important for the ecology and conservation of elephants. It gives Indian elephants a vital habitat, connection, and also promotes research possibilities while emphasizing the need of biodiversity preservation and fostering cooperation between humans and elephants.

2. Kaziranga National Park and Tiger Reserve, which has a mosaic of large grasslands, wetlands, and dense woods, serves as the core zone of this elephant reserve and is home to more than a thousand wild elephants, assuring the population's long-term survival.

3. The deployment of the "Special Rhino Protection Force" in the Kaziranga Tiger Reserve and the "Assam Forest Protection Force" in the elephant reserve's divisions, coupled with suitable infrastructure for anti-poaching camps and contemporary weapons, has improved the protective mechanism (KTR).

4. The state administration has issued a special decree permitting the forest staff to use firearms and granting them immunity. Additionally, the Assam Wildlife Protection Act was amended, strengthening the penalties to include both a fine and life in prison for any poaching activity.

5. The State Government's notification of nine animal corridors covering this Elephant Reserve would guarantee the elephants' long-term safety crossing the National Highway, particularly during the yearly floods. Additionally, communities in peripheral areas are aware of and actively involved in ensuring the safety of the animals.

6. To prevent unauthorized development and outlaw mining, the State Government has advised MOEF&CC to declare the majority of the Elephant Reserve an Eco Sensitive Zone of KTR.

7. Establishment of anti-predation squads and solar-powered fencing in sensitive areas with the active participation of local communities by hiring them directly as safari drivers, employees of ancillary small businesses like garages, as staff members of resorts and hotels, as tour guides, etc. In addition, timely payment of the ex-gratia grant has built trust with the people in the management of the human-elephant conflict.

8. Dynamic ecological and biological processes such as sedimentation and regeneration of grasslands caused by repeated flooding, as well as the addition of water bodies, contribute to a bio diverse environment suited for wildlife, including elephants.

9. The radio collaring of two elephants in the Golaghat division as part of a research study would aid in understanding mobility patterns and habitat utilization, which could assist in conservation planning.

10. With a senior veterinarian, a Forest Vety Officer, and CWRC at Panbari, Kaziranga TR has an effective facility for maintaining the health of wild and captive elephants.

11. The establishment of the "KNP Staff Welfare Society" with a seed budget of Rs. 4 lakhs obtained as an award during 1998 and 1999 has been an invaluable asset for staff welfare by facilitating financial and moral support to the frontline personnel.

MANAGEMENT WEAKNESSES

1. The Elephant Reserve lacks a Management plan for systematic conservation and strategic direction to steer and accomplish the objectives of elephant conservation. Additionally, the revision of the Working plan for the forest divisions that make up the Elephant Reserve has been delayed for a while.

2. The Elephant Reserve's boundaries have not been accurately surveyed and documented. Forest lands have been encroached upon as a result, particularly in Karbi Anglong, Golaghat, and Nagaon South Division reducing elephant habitat.

3. Degradation and shrinkage of elephant habitat in Karbi Anglong area due to large scale Jhoom Cultivation after slash and burn of forested areas and, although most of the minings has been closed as per direction of the HBL Supreme court, yet mining is a serious cause of concern for long term survival of elephants in this region.

4. The elephant population in this Reserve has been falling over the past ten years, from 1246 in the Animal Census of 2005 to 1089 in the Animal Census of 2017 (KNP). Concerning statistics include the mortality rate of elephants, which increased from 29 in 2005 to 50 in 2013 KNP.

5. There is a lack of cooperation about elephant conservation between the Forest Divisions, District Administration, Police, Panchayats, and other stakeholders.

6. The Elephant Reserve is not managed by a single administration. The Karbi Anglong Autonomous Council's forested lands have independent management and government framework. There is a lack of coordination of council with KTR and other forest divisions that hinders conservation and corridor management.

7. The District Magistrate has not taken any action or issued an order in response to the State Government's Gazette Notification No. FRW.7/2022/ Pt V/01 dated 01/04/2022 regarding animal corridors. This will negate the intent of the State Government's significant action to halt land use change within the animal corridors.

8. Elephant habitat and biodiversity values have not been properly assessed, and there are no policies in place to lessen risks. Elephant habitat is being degraded by soil erosion brought on by slash and burn agriculture and timber theft in Karbi Anglong.

9. The state and Central Government's budgetary provision is ad hoc and insufficient for priority conservation initiatives including habitat conservation, HEC control, and infrastructure development for elephant conservation in particular.

10. The staffs of Karbi Anglong and other Forest Divisions lacks training in wildlife management techniques such as tranquilization, habitat enhancement, rescue operations, and HEC, among others.

11. There is a significant staffing shortfall at all levels, particularly for elephant mahouts and grass cutters (in KTR), which makes it difficult to patrol for protection and oversight in outlying areas.

12. A “Samanway Committee” was established to foster improved communication and assistance from neighbouring villages. A group called “Saku” was also established, which included hoteliers and resort owners, to monitor any suspected poaching activity. However, this committee appears to have been neglected and is now defunct.

13. A wall built by Numaligarh Refinery at Deopahar PRF along the historic route of elephant migration was demolished in accordance with the Supreme Court’s order, which must be carried out in the proper spirit.

14. The proliferation of hotels and dhabas with tall concrete barriers along NH 37, the transfer of agricultural land to commercial use, and the building of deep trenches by tea gardens along the NH and elsewhere all prove to be death traps for elephants and other marooned animals during floods.

IMMEDIATE ACTIONABLE POINTS

1. The Project Elephant Division shall provide all Elephant Reserves with consistent directives and guidelines for the creation of Management Plans. They might also consider launching a program similar to Mike.

2. Management Plan/ Perspective Plan of the Elephant Reserve should be prepared at the earliest. There is a need to include separate chapter on Elephant management in TCP of KTR and working plans of the Divisions.

3. The TCP which was submitted to the NTCA, Government of India have been sent to the management for few minor revisions. KTR authority should submit the revised TCP at the earliest.

4. The Working Plan Division should be involved in establishing the Elephant Reserve’s boundaries and developing maps. Working plans should be created where they don’t already exist in divisions and those that do, should be amended with a focus on elephant conservation and HEC reduction.

5. After a suitable mitigation strategy has been put in place and the provisions specified in the notification of animal corridors of Kz-KA ER Corridors, which is to be carried out by the district magistrate, a Corridor Management Plan should also be created to facilitate elephant migration. The ER authority may use WII and FSI for assistance.

6. In the degraded regions, a program for habitat improvement should be put into place. After careful evaluation and planning, eco restoration of abandoned jhum agricultural areas should be prioritized.

7. The MOEF&CC's guidelines for reducing conflict between humans and elephants must be followed. Launching an early warning system, such as mass SMS to stakeholders and villagers, will inform villagers and anti-depredation teams to take prompt action.

8. In the Ranges where there is a significant amount of elephant depredation, a Quick Response Team (QRT) should be established. To cope with elephant depredation and rescue operations, these QRT should be given specialized vehicles equipped with all necessary tools.

9. Mobile E-monitoring Applications for daily tracking of the elephant population and their movement patterns by camps and patrol personnel should be introduced.

10. Staff should be provided with Standard Operating Procedures (SOP) for the management of HEC, control, and the rescue of runaway elephants.

11. As state power department actions are still pending, the Supreme Court of India's decisions and MOEF&CC guidelines given to prevent elephant electrocution must be carried out immediately.

12. District level committee should be formed for regular monitoring of implementation of orders pertaining to all issues regarding the management of elephants.

13. Research, Monitoring and Training Plan should be prepared focusing on conservation and management of Elephants.

14. System of submission of Annual Report by all Division should be introduced which will help in preparation of APO and strengthening data bank focusing on effective management to achieve goals of elephant conservation.

15. Financial allocation by State and Central Govt need to be enhanced for proper protection measures including infrastructure development and HEC.

16. There is need for unified administration for effective management of the Elephant Reserve. Field Director, Kaziranga TR may be appointed as the Director of Elephant Reserve too. The FD/ KTR should also be used to channel funds to the divisions.

17. Elephant Reserve level coordination committee under the unified control of the FD KTR as "FD K-KA ER" need to be formed to ensure efficient coordination among various Departments and stakeholders. This committee should hold regular meetings for effective protective measures and ways to

lower HEC.

18. Field staff positions should be filled as soon as possible, notably those for mahouts and grass cutters in the KTR, which is home to more than 50% of the Reserve's elephant population.

19. Coordinating public awareness programs across districts and states will assist in educating people about elephant conservation and encourage responsible behaviour. This will help to facilitate human elephant coexistence in the ER.

20. The East Karbi Anglong Division's Dolamara PRF is a crucial area for K-KA ER and ought to be raised to RF status or included in the East Karbi Anglong WLS.

21. While notifying the Kaziranga- KA Elephant Reserve in 2003, Kaziranga was not notified as a Tiger Reserve that includes the Laokhowa- Burachapuri WLS, and Biswanath division etc. therefore amended re-notification of ER is advised.

22. The Kz-KAER boundary has to be properly marked on the ground, especially on the Karbi Anglong side, by adding boundary pillars and signage for elephant reserves, among other things. It is necessary to conduct a thorough survey of RFs and PAs located within the Elephant Reserve.

23. It is crucial to exchange information on conflict, migratory patterns, and elephant populations. Creating a single database that all pertinent authorities can access can help with making well-informed decisions.

24. Although the website is not currently updated, a substantial amount of information about Kaziranga is readily available online. The website needs to be updated soon. In consultation with the forest department, hotels should distribute leaflets, brochures, and other educational materials.

25. Elephant life care center for rescued or orphaned wild and elderly, orphaned or retired domestic elephants should be established at State level in Guwahati. The state government must present a proposal to PE, GOI.

26. Assistance from tea garden owners and managers- The use of chemical pesticides should be completely banned, and tea growing in the Kaziranga region should be made mandatory to be organic. CSR should also be used to utilize the appropriate resources available with tea gardens, such as tractors, and to raise awareness and create livelihood opportunities.

27. The request for CWLW to have the authority to gather CDR reports and data so that they can be shared with the department may be accelerated. The park's staff should only utilize mobile devices under strict control (and usage should be monitored).

28. To enhance the collection and fund for Tiger foundation Green- cess should be levied from all the hoteliers, resort owners etc.

29. Mahouts training and vet trainings and fire arm training should be conducted frequently. The KTR authority may sign an MOU with the relevant authorities for this.

30. Each range of KTR should have veterinary assistance to collect samples for roadies. MIKE etc

Certain activities such as those mentioned below should be strictly prohibited in the corridors: -

- Construction of deep trenches (beyond a foot in depth)
- Construction of walls and fencing erection.
- Open deep well
- Straight edge deep fisheries and ponds.
- Any other man- made structure that may obstruct movements of animals.
- Human activity is causing more noise and sound pollution in the KKAER area's natural acoustics.
- Human activities interfering with the natural lightscape of the area. There should be no naked lights in the corridors and along the NH, RFs and the PAs of the KKAER.
- Within one kilometre of the corridors, RFs, and PAs, no land should be converted from agri cultural, forestry, orchard, or plantation to residential, commercial or industrial.
- The identified functional corridors must also be kept free from human interference and change of land use.

Following must be strictly implemented for domestic/ captive elephants

- Within six months after the TCP's approval, all captive elephants and calves must have their DNA profiled and micro chipped with the KKAER and the projected Kaziranga environment.
- All un-indexed elephants must be confiscated.
- An elephant database with ownership profiles, DNA profiles, pictures, and event records will be kept up to date.
- DNA profiles are required for all elephants entering the KKAER and the projected Kaziranga environment; otherwise, the elephants' risk being apprehended.
- Owners and their agents must provide notifications of pregnancy (within a reasonable time frame), calf birth (within 24 hours), and death (within 24 hours) via SMS, email, or toll-free phone numbers.
- A new-born calf's DNA should be profiled within six months, then again at five years, and finally when it reaches adulthood along with photographs.
- All historical data should be maintained in an Elephant Health Book.
- Efforts should be undertaken to create a stud book of the captive elephants, as was done in the past for the elephants of the Kaziranga National Park (1998).

ANNEXURE II

MANAGEMENT STRENGTHS, WEAKNESSES AND ACTIONABLE POINTS FOR SIMLIPAL ER, ODISHA, EAST-CENTRAL REGION

Introduction: About the Elephant Reserve

Mayurbhanj Elephant Reserve was notified on 29/07/2001 vide No. 8F(W)-42/20011506/F&E by the Odisha Forest and Environment department in pursuance to the guidelines provided by the Project Elephant Division, MoEF&CC, Govt. of India. Mayurbhanj Elephant Reserve (MER) which is the formal name of Similipal-Kuldiha-Hadgarh Elephant Reserve is located in the Keonjhar district of Odisha. Mayurbhanj Elephant Reserve is situated at a latitudinal and longitudinal extension of 860-20'and latitude 210.16' to 200.45' (north). The entire area of MER in Odisha is 7043.04 km^2. According to the FSI Forest Type (2009) classification data, there are various forest type in the MER which includes semi evergreen forest, moist peninsular low-level Sal Forest, West Gangetic moist mixed deciduous forest, Northern secondary moist mixed deciduous forest, dry peninsular Sal Forest, northern dry mixed deciduous forest and dry deciduous scrub.

Three protected areas, namely Hadgarh Wildlife Sanctuary, Kuldiha Wildlife Sanctuary, and Similipal Tiger Reserve, are included in MER. Reserve forests, protected forests, private lands, and revenue lands are also included in MER. These agricultural or revenue lands stretch for roughly 3571.26 kilometers next to the MER. Tourists are frequently drawn to the Mayurbhanj Elephant Reserve because of its stunning landscape. The Hadgarh Sanctuary and its reservoir, which borders the Baula Hills, are the primary features of the MER. The Salandi River, which originates in the southern Similipal Tiger Reserve, serves as the foundation for the Hadgarh reservoir. Simlipal National Park, which is situated in the Odisha district of Mayurbhanj, is also included in MER. With an area of 845.70 km^2, Simlipal National Park is home to wild elephants, chausingha, royal bengal tigers, and beautiful waterfalls such as Joranda and Barehipani and also features an orchidarium.

MANAGEMENT STRENGTHS

1. Mayurbhanj Elephant ER is the largest, intact elephant habitat in the entire east-central region. The Mayurbhanj ER has comparatively low level of habitat fragmentation.

2. The Similipal Tiger Reserve, which forms the core of the Mayurbhanj ER is a large block of intact forests, with a favourable shape factor with desirable area to perimeter ratio.

3. It is the first & biggest ER in Odisha and one among the first three declared ERs in India during 2001.

4. The vastness of its area is the main favourable aspect of the Mayurbhanj ER: The area of the Reserve is sprawling over 7043.74 km2 across 3 districts of Odisha and comprising of 4 Protected Areas within it.

5. The 4 Protected Areas of Mayurbhanj ER include Similipal, Kuldiha and Hadgarh Wildlife Sanctuaries; and the Similipal-Hadgarh-Kuldiha Conservation Reserve. These Protected Areas constitute more than 40% of the total ER area.

6. The Mayurbhanj ER harbours nearly 30% elephant population of Odisha.

7. It is one of the biggest watersheds of the state with maximum number of perennial streams, and even major rivers originating from.

8. Mayurbhanj ER is endowed with rich floral diversity and a high level of en demism. The Similipal Tiger Reserve in particular encompasses a diversity of forests ranging from Northern Tropical Semi-evergreen to Northern Tropical Moist & Dry deciduous forest formations dominated by luxuriant growth of Sal (Shorea robusta).

9. The habitat of 1194 km2 falling within Similipal TR is rich, diverse and provide a safe haven for elephants with adequate food and water resources throughout the year.

10. The Mayurbhanj Elephant Reserve is coming under unified control of the Field Director, Similipal tiger Reserve-cum-RCCF Baripada. This is amenable for implementing standard management practices with potential for active inter-divisional coordination, cooperation, mobilizing staff and other resources across divisions and less inter-divisional conflicts.

11. Mayurbhanj is a tribal-dominated district in Odisha and the ER has unique cultural diversity. The ER is home to several forest-dependent tribal communities like Ho, Santhal, Kharia, Mankadia and others.

12. Similipal Tiger Reserve has a long conservation history. The sanctuary was among the 9 Tiger Reserves notified during 1972. The sanctuary has been conventionally well protected.

13. Lately, there is proactive delivery of service and compassionate ex gratia payment for conflict-related losses.

14. The Mayurbhanj ER has a dedicated veterinary service to attend to any exigencies.

15. There is also very active inter-state coordination with West Bengal & Jharkhand States.

16. There is also very active interdepartmental coordination, particularly with the Railway and Power Distribution companies in minimizing elephant deaths on tracks and due to power lines.

MANAGEMENT WEAKNESS

1. The Elephant Reserve has four frequent elephant movement paths which act as inter-divisional (Similipal-Kuldiha, Similipal Hadgarh Link) and inter-state movement corridors for elephants between Odisha, Jharkhand and West Bengal. Some of these corridors are not actively used by elephants. The elephant movement has changed considerably during the last few decades, especially those involving Jharkhand and South Bengal populations. Annual migration and stay of very large herd of elephants from these states to Balasore through Rasgovindpur and Betnoti, whose entry points keep on changing every year.

2. Existing corridors are degraded and suffers from biotic interference.

3. Backwardness, Poverty and associated poor socio-economic condition are relatively high in the Mayurbhanj District. Consequently, dependence on forests by villages both in the periphery as well as core is high. The main form of biotic pressure in the form of fodder for livestock.

4. Dependency on NTFP is also very high among the villages both within the ER and also in the periphery.

5. Mayurbhanj is a very sensitive area as it falls within the trade route for illegal wildlife trafficking. Being close to interstate boundaries, there is considerable risk in across the state wildlife trafficking.

6. High shortage of frontline staffs remains a concern for a long time.

7. Recurrent forest fires that seriously affect the productivity and quality of the habitat. Fires are mostly human-induced.

8. Low involvement of local NGOs and locals of the sensitive villages.

9. Increasing human population of the adjoining villages with high dependence on forests.

10. High population of unproductive cattle and livestock.

11. Increasing man-wildlife conflicts, particularly with elephants. The elephant-related conflicts are high particularly involving migratory elephants operating along the boundary areas of Jharkhand and Odisha.

12. Existing quarries and mining activities. The Kuldiha – Hadgarh corridor, which is quite critical is especially affected by the stone quarry activities. Similarly, mining activity at Badampahar and National Highways with continuous increase in traffic have severely affected and compromised the Badampahar corridor.

IMMEDIATE ACTIONABLE POINTS

1. Demarcation of the ER as per notification need to be carried out and boundary pillars posted all around the periphery

2. Frontline staff vacancies need to be filled up immediately and regularly thereafter.

3. Resource dependent communities particularly on Siali leaves/ fiber and other such NTFP need to be identified. Income Generating Activities need to be taken up targeting these villagers to improve the elephant habitats.

4. Unusually high mortality rate of elephants in Kuldiha WLS without definitive reasons need to be probed and preventive measures need to be taken.

5. Many elephants have died in the ER reportedly due to Anthrax. The protocol in this direction for prevention, monitoring and surveillance of the disease should be followed systematically in the ER for preventing any possible outbreak.

6. One of the major reasons for large number of elephant related conflict cases occurring in crop raiding situation is not adopting the best method for driving of elephant herds by the villagers and staff. Massive capacity building of staff and villagers need to be planned and implemented.

7. In view of Comprehensive Action Plan for Conservation of Elephants and Mitigation of Human Elephant Conflict in Odisha (CAP), and Site-specific Elephant Management Plan for Baripada Circle prepared by the FD-cum-RCCF, Baripada there is an immediate need of preparing detailed year wise work schedules, Budget estimates and man power needs. The steps should also be taken to secure allotment and other resources.

8. The plans of territorial forest divisions are required to be mainstreamed with elephant conservation in respect of areas in their division in the Elephant

Reserve. Mapping and Assessment in the entire ER for availability of palatable elephant fodder trees and grasses alongwith identification of all potential areas to meet the gap by planting of fodder trees and developing of grasslands is required.

9. The areas situated in territorial divisions face problems of inadequate re sources. The requirement of number of APCs, manpower and other facilities in these divisions has to be thoroughly assessed and the gaps have to be made up urgently, as these are the hot spots of severe Human Elephant Conflicts

10. Research and studies to be taken up to know the home range, migratory routes and movement pattern of different clans utilizing the elephant habitats in the ER both spatially and temporally.

11. Habitats in Kuldiha -Similipal Corridor needs to be rehabilitated with suitable reforestation and SMC measures. It is time to enact the principle of "payment for eco-system services" to the villagers who contribute to the improvement of corridor habitat

12. Elephant passes of right dimensions at right places at Bangriposi ghat and Badampahar need to be completed at the earliest to facilitate smooth movement of elephants

13. A robust Grievance Redressal system at Divisional and RCCF level for receiving and redressing grievances of local villagers in a systematic manner for elephant related issues at the local level both online and offline needs to be put in place immediately.

14. CZA approved proper Rescue and Rehabilitation center with adequate veterinary services need to be put in place

15. A strong network of Rapid Response team (RRTs) with the involvement of locals and NGOs, especially in territorial divisions, in accordance with the guidelines issued by the MOEF&CC need to be put in place to mitigate the human-wildlife conflict.

16. A model multi-pronged strategy for rural development based on agro-horticulture with emphasis on non-palatable variety of paddy crop need to be taken up in collaboration with IARI, Agriculture and Horticulture department.

17. Since there is no Disaster management plan it is necessary that the ER should prepare a disaster management plan. The staff should be trained and equipped according to it for better preparedness and effective handling of the situation.

ANNEXURE III

MANAGEMENT STRENGTHS, WEAKNESSES AND ACTIONABLE POINTS FOR SHIVALIK ER, UTTARAKHAND, NORTHERN REGION

Introduction: About the Elephant Reserve

Shivalik Elephant Reserve (SER) was notified on 28/10/2002 vide no 1777/1②/2002 by Government of Uttarakhand. It is spread over an area of 5405.07 sq. km and includes two Tiger Reserves, Corbett and Rajaji and 11 Forest divisions of Kalsi soil and water conservation, Dehradun, Haridwar, Landsdowne, Ramnagar, Haldwani, Terai West, Terai Central, Terai East, Champawat and Narendranagar.

The Shivalik elephant Reserve forms part of the Indian portion of Terai Arc Landscape (TAL), stretching from Yamuna River in the west to the Sharda River in the east, spread across eight districts of Uttarakhand along the Shivaliks and Gangetic plains. This unique Landscape consists of two distinct zones: (i) Bhabar, characterized by a hilly terrain with coarse alluvium soil and boulders, and sal mixed & miscellaneous vegetation communities and (ii) Terai, characterized by fine alluvium soil with clay rich swamps dominated by a mosaic of tall grasslands and Sal forests. The Terai, in particular, is listed among the globally important 200 eco-regions for its unique large mammal assemblage. Over the decades due to large number of agricultural settlements and development projects this landscape has become highly fragmented and degraded. Despite its ecological richness and faster rate of degradation, conservation initiatives have resulted in arresting further deterioration of the habitat.
This landscape consists of the Shivalik hills, the adjoining bhabar areas and terai plains. These three strata are in the form of narrow strips running parallel to the main Himalaya and there is a continuum of forests and wildlife populations across these zones.

ATTRIBUTES AND STRESSORS

- The SER forms a continuous large ecological landscape with 10 corridors extending from the Kalsi Forest division in the west to the Terai East Forest Division.

- The SER contains homogenous vegetation communities of eight broad types, but the structural components vary highly across the landscape. The vegetation comprises of a mosaic of dry and moist deciduous forests, scrub savannah and productive alluvial grasslands.

- The SER harbour diverse and rich fauna including several endemic and globally endangered species. Prominent among them are the tiger, Asian elephant, one-horned rhinoceros, swamp deer hog deer, hispid hare, Bengal Florican and swamp francolin

- Ungulate distribution and relative abundance in SER correspond to the high variation or heterogeneity in habitat features, however, the overall status of prey (ungulate) availability is reasonably better in this landscape, largely owing to the interspersion of Protected Areas between Reserve Forests.

- The SER has numerous perennial rivers and seasonal streams flowing from the Himalayas into the Gangetic plains bringing silt and ensuring availability of water perennially, for the surrounding agricultural landscape

- The SER provides opportunity for sustained livelihood opportunities of the local communities which support the conservation efforts in the landscape

- Human population increase, habitat encroachments, poaching, firewood extraction and bhabar grass (*Eulaliopsis binata*) collection for rope making, boulder mining causes enormous disturbance and fragmentation.

- Chilla- Motichur and Gola River corridors should be established on a priority basis and the conservation of tiger and elephant habitat along the foothills of the Himalaya will ensure the future of one of the finest terai habitats

- There is an urgent necessity to remove encroachments at least from some crucial habitats to arrest the growing threat to wildlife habitats and to establish animal corridors

- The remaining Gujjar families and others occupying prime forest areas and impeding animal corridors from Yamuna to Sharda River should be rehabilitated.

- The lopping of trees, grazing of cattle and collection of forest biomass (fire wood, small timber, NTFP etc.) impede natural regeneration and should be controlled.

- The invasive alien species are suppressing natural growth, aggravates fire and limiting the availability of forage species should be eradicated.

- The growth of linear infrastructure, hydro-electric projects, heavy vehicular traffic, ever expanding resorts are detrimental to free movement of elephant and other animals and exacerbates Human Elephant conflict.

MANAGEMENT ACTIONS AND INITIATIVES

1. Unified control and Governance

The Tiger Reserves (CTR & RTR) area has expanded over the years for maintaining ecological contiguity and creating buffer as shock absorbers to the inviolate habitat of elephants and tigers; however, these buffers though form part of tiger reserves are not under the direct control of FD. There is a need to bring administrative control of outlying forest divisions under the control of FD of TR. One senior officer amongst the units of SER should be made the controlling officer for implementing Elephant conservation plan.

2. Rationalisation of Boundary of SER

The SER was notified in 2002; subsequently the population dynamics and ranging pattern of elephants have been altered with disruption of traditional migratory paths. It is necessary to study the migratory paths and rationalize the boundaries of the SER.

3. Ranging and foraging pattern of Elephants

The population dynamics of elephants, it's ranging and foraging patterns and its distribution in different season should be monitored, management intervention should be initiated to mitigate effects of habitat utilization, impact of invasive species, human elephant conflict.

The efficacy of barriers erected to prevent dispersal of elephant outside the habitat should be evaluated; most efficient protective barriers should be erected.

4. Managing Mosaics of Habitats

The mosaic of habitats created by interspersion of vegetation types, ecosystems, hydrological regimes (riverine, riparian forest, wetlands, grasslands and marshes etc.), and their juxtaposition should be managed as it affects the wildlife habitat relationship.

5. Planning for removal of Invasive Alien Species

Large tracts of forest in SER have been invaded by Lantana, its spread and invasion to new areas is to be identified and mapped. The current targets for eradication are not keeping pace with the new invasions, our efforts are miniscule considering the extent and intensity of spread of weeds. It is necessary to study best practices, adopt and innovate new and efficient cost-effective methods to eradicate Lantana.

6. Fire management

The plans of various units in SER have outlined a fire management strategy stipulating that annual fire management plans are to be drawn based on current data and satellite imageries if available. In spite of this fire incidences keep

occurring. To monitor and manage fires a monitoring protocol as prescribed in some plans should be rigidly adhered with review of the control burnings undertaken, manpower deployment and availability of equipment.

7. Forest Protection

Forest protection strategy should be reviewed to provide additional deployment of frontline staff in vulnerable areas, establishing additional floating anti-poaching camps, coordination with division with scanty resources and improving intelligence gathering by dedicated professional full-time staff and enhancing communication effectiveness.

8. Managing Wetlands and prime foraging habitats

The status of wetlands, riparian forest and grasslands need regular monitoring as infestation and spread of IAS, invasion of woody species, habitat utilization and fire rapidly cause deterioration of habitat. The catchment of these wetlands is fragile and requires protection.

9. Threats from anthropogenic pressure from Gujjar

There are rules for lopping and grazing of cattle in buffer areas of Tiger Reserves and Forest Divisions which are not rigidly implemented. This is an important socio-economic issue in the entire SER and must be monitored by dedicated staff in the areas prone to such anthropogenic pressure. The schemes for rehabilitation of remaining Gujjars have to be expedited.

10. Community based Ecotourism

Ecotourism strategy has been elaborated in the TCP and working plan and is generating revenue for the TR/Forest Division and also providing employment opportunity for the local youths. Ecotourism model of Periyar and KMTR accredited as the best model which has a large community involvement through EDC is to be replicated in the SER. This model provides livelihood opportunity not only to individual but the entire community. The ecotourism services like transport, accommodation, housekeeping and laundry, souvenir shop is managed by SHG. In SER few local youths get benefit of ecotourism while others are deprived of any benefit. This has caused resentment and support for conservation from local communities is waning.

11. Veterinary support for managing HEC

SER has veterinary units in the Tiger Reserves but the buffer Forest divisions which are mainly affected by the HEC have no such immediate veterinary support. There are two large rescue centers in the SER, Dhela and Chidiyapur and these can cater to the needs of the entire SER provided the Veterinarians, paramedics, compounder are posted as per the requirements of the landscape. The infrastructure of the rescue center with kraal and holding facilities for rescued

animals is to be upgraded. The two centers must be given jurisdictional authority so that they can professionally provide veterinary support.
The occurrence of Zoonotic disease is a matter of concern in the SER, surveillance and prevention for disease like anthrax, rinderpest, foot-and-mouth disease to protect elephant and livestock from zoonotic diseases, Wildlife Health Management and Disease Surveillance Plan for the entire landscape should be prepared.

12. ESZ Notification

Eco-sensitive Zone (ESZ) notification is to be prepared for the PA and action taken to get them notified. These are necessary as they provide a buffer and shields from the deleterious external environmental effects.

13. Corridor Management

The SER landscape has 10 corridors and for their management an integrated and holistic corridor management plan is to be formulated. The plan should include the current land use and likely impacts due to growth and development around the area. A survey of the land ownership and identification of new linear infrastructure likely to impact the area is required to guard against any future intrusions.

ANNEXURE IV

MANAGEMENT STRENGTHS, WEAKNESSES AND ACTIONABLE POINTS FOR NILGIRI ER, TAMIL NADU, SOUTHERN REGION

Introduction: About the Elephant Reserve

Nilgiri Elephant Reserve (NER) was notified on 19/09/2003 vide No. G.O.(Ms) No.151 by the Tamil Nadu Forest Department in pursuance to the guidelines issued by the Project Elephant Division, MoEF&CC, Govt. of India. It includes erstwhile Reserved Forests and Protected Areas; now reconstituted in Mudumalai Tiger Reserve (MTR), Sathyamanagalam Tiger Reserve (STR), Cauvery North & South Wildlife Sanctuaries (CWLS) and Forest divisions of Nilgiris, Gudalur, Erode, Dharmapuri and Hosur.

There are 3 important zones with relatively intact habitat and with large elephant populations within this elephant reserve. They are as follows:

1. Western Ghats portion of MTR, Nilgiris & Gudalur forest divisions with moist and dry deciduous forests and having a high elephant density.

2. Eastern Ghats portion of STR & Erode division with a diversity of forests including dry thorn forests, deciduous forests, montane shola - grass lands and having a medium elephant density.

3. Eastern Ghats along the Cauvery River in CWLS and Dharmapuri & Hosur forest divisions with dry deciduous forests and dry thorn forests and having a medium elephant.

Nilgiri Elephant Reserve spreads over an area of 4662.45 km^2 and is located in the North-Eastern edge of the state bordering Mysuru ER of Karnataka in the North along with Wayanad and Nilambur ER of Kerala in the West and Coimbatore ER in the South.

MANAGEMENT STRENGTHS:

- The NER forms an integrated and contiguous landscape with the Mysuru ER of Karnataka in the North along with Wayanad and Nilambur ERs of Kerala in the West and Coimbatore ER in the South and is significant in terms of gene flow and forest integrity.

- The rich biodiversity of the NER harbours many rare, endangered and threatened plants and animals listed in the IUCN list and are quite rich in the medicinal plants and NTFPs.

- The NER provides numerous ecosystem services and forms a significant catchment for many streams; ensuring availability of water perennially, for the surrounding agricultural/ rural landscape.

- The NER has great potential in providing supplemental livelihood opportunities to the surrounding communities besides eliciting good support from the local communities.

- Protecting the NER is far more important for the larger ecological, agricultural and cultural landscape which also offers a good research base due to the availability of sizeable scientific database.

MANAGEMENT WEAKNESSES:

- Due to anthropogenic pressures from forest fringe villages and lack of boundary protection in certain areas, the overall biodiversity values face severe threat including threat of encroachment.

- Collection of NTFP, timber and firewood, and cattle grazing impede regeneration, which is key to the rejuvenation of the reserve including transmission of diseases from the free ranging livestock.

- Over spread of exotic /invasive weeds like Lantana, Prosopis and Senna in the ER causes habitat degradation and deficiency of rain during summer months aggravates forest fires.

- Presence of linear intrusions, hydro-electric projects, heavy vehicular traffic, ecologically incompatible resorts and enclaves effect the elephant movement/ corridors and add to the HEC.

- Considering the various management issues like protection and community engagement, the staff strength is grossly inadequate and lack of funds adds to the management difficulties.

IMMEDIATE ACTIONABLE POINTS

1. Management harmonization of NER

Presently, there are 3 different supervisory controls for the 7 territorial units in the NER constituted by 2 Tiger Reserves, 1 Protected Area and 4 Forest Divisions. As the Elephant Reserve is a management unit and not an administrative unit backed by any law or code, there needs to be a management harmonization in the implementation of different strategies suggested in the Tiger Conservation Plan, Forest Working Plan and Management Plan in the absence of the Elephant Conservation Plan (ECP).

To begin with, we need to designate one of the Controlling officers in the NER from the 3 officers as the Coordinating officer. Considering the elephant habitat and elephant density with related issues, one of the Field Directors of the Tiger Reserve, Mudumalai TR or Sathyamanagalam TR could be designated for the purpose. There could be a monthly meeting to discuss NER and elephant related issues amongst them for the purposes of management harmonization.

2. Boundary Demarcation of NER

As per G.O (Ms) No 151 dated 19-09-2003, Nilgiris Elephant Reserve (NER) has been declared with a total area of 4,66,245 ha with a core area of 71,622 ha and buffer area of 3,94,623 ha covering the erstwhile Mudumalai WLS & NP, Gudalur / Nilgiris (N&S) / Sathyamangalam / Erode / Dharmapuri / Hosur forest divisions. After the bifurcation of Sathyamanagalam division into two, Hasanur division was also notified vide G.O. (Ms) No 114 dated 19-10-2015 as elephant reserve.

Considering later declarations of MTR, STR and CWLS in the notified NER, it is observed that the existing areas of the erstwhile forest divisions do not match with the present area. As per the details provided, it is observed that the total available area of all the territorial units of NER is approximately 7053.12 km^2 whereas the area of the Nilgiri ER by gazette notification is 4662.45 km^2.
It is therefore suggested that the boundary of the NER needs to be clearly demarcated both on the map and ground. The forest boundary consolidation may be completed using DGPS and construction of boundary cairns, preferably, at an interval of 50 meters (at curves) or 100 meters (straight boundary) by prioritizing vulnerable areas abutting forest fringe villages. The enclaves could be separated by trench as there is always a threat of expansion of the area by encroachment. In case of chain-link fencing, corridor for wildlife movement should not be obstructed.

3. Decadal Change in Forest Cover

The decadal assessment of change in forest cover within Tiger Reserves (MTR & STR) by Forest Survey of India, Dehradun during the period between IFSR 2011 (2008-09 satellite data) and IFSR 2021 (2019-20 satellite data) was carried out primarily to assess the impact of various conservation measures and management interventions during the period. As per the change analysis matrix, it is observed that the forest cover during IFSR 2011 was recorded as 700.57 km^2 (for MTR) & 1330.60 km^2 (for STR) and in IFSR 2021 as 689.88 km^2 (for MTR) & 1360.30 km^2 (for STR) with a difference of -10.69 km^2 (-1.53%) in respect of MTR and + 29.70 km^2 (+2.23%) in respect of STR.

As per the above data, without going into the details of the areas of change in the canopy class (>10%), there is an urgent need to verify the locations, where loss or gain in the recorded forest area has been reported in respect of MTR and STR or whether the difference is only due to the variation in the digitized boundary and actual boundary on the ground.

4. Wildlife Population dynamics

For maintaining healthy wildlife population dynamics and also for ensuring landscape and forest spatial heterogeneity, it is essential to know the distribution pattern of the major mammals in the landscape. In the absence of regular monitoring and population estimation, it is difficult to plan any management intervention; besides, animals straying out in the agricultural lands not only cause human wildlife conflict but also make animals susceptible to poaching.

All efforts may be envisaged to not only conduct regular population estimation exercise but also to plot the distribution pattern of major mammals on spatial domain for planning wildlife protection measures.

Efforts may be also be envisaged in the development of intelligence network besides erection of barriers (steel rope/ solar / hanging fences) in the fringe areas; involvement of the NGOs in wildlife protection along with the propagation of Tree Cultivation as part of Agro-forestry component under Eco-Sensitive Zone in such areas, where corridor connectivity is contemplated.

5. Managing Specific Habitats & Developing Grassland Mosaics

There is need to manage forest habitat including recognizing the importance of fruit-bearing trees in wildlife areas. There is also necessity to recognize the ecosystem and wildlife value of the defective and dead wood (snags and down logs) instead of their value for salvage, as such trees and snags provide key cover and foraging habitats for cavity excavating birds and secondary cavity nesters (woodpecker holes). The wooden logs on the ground (down-logs) are also key habitats for invertebrates, reptiles and small mammals. So, any manipulative management practices need to be carefully considered in the light of the ecology and wildlife values of NER especially the four territorial forest divisions.

As a management intervention, the select standing trees in the forest area could be manipulated into snag or den trees with a minimum of 10 trees per hectare for enriching the wildlife habitat; besides, small mosaics of grassy patches may be created in the forest areas for building up ungulate population especially by treating weed infested areas.

6. Eradication of Invasive Alien Species

Majority of invasives belong to Asteraceae/ Verbenaceae because of efficient adaptation for survival / distribution on land. While the impacts of IAS are classified as environmental, economic & health related, these categories are not mutually exclusive. Costs of biological invasion are measured not just in currency, but also as food & water shortages, environmental degradation, loss of biodiversity, natural disasters etc.

Managing Invasive is considered integral to any wildlife habitat including that of elephants. NER is mostly infested with the invasive like Lantana camara, Prosopis juliflora, Senna spectabilis, Mikania micrantha etc. Effectively addressing the problem can require territorial units to invest substantial resources in management operations and work to restore ecosystems in order to re-produce their goods and services.

During the field visit, successful removal of the Lantana camara by 'Root and Stock' method was seen in the areas of MTR, STR & CWLS; removal of Senna spectabilis in MTR and STR through TNPL; and Prosopis juliflora in Dharmapuri tract. The cleared areas were also planted with the grass to avoid its re-occurrence in the area.

Considering the level of infestation, it is felt that the area with the invasives need to be mapped spatially by using remote sensing technology and a detailed plan needs to be prepared for complete removal in a specified time limit. Besides, as worked out for Senna through TNPL, cost benefit analysis for Lantana also needs to be worked out through EDCs/ VFCs, so as to provide economic value to the product and help in its early removal.

7. Development of fire management and protection strategy

It is a known fact that all fires are man-made and the number of incidences over the past many years is quite high; and therefore, forest fires in the NER requires intensive management due to its deleterious effect on the wildlife habitat.

As part of forest fire management, it is suggested to develop strategy based not only on the fire sensitivity / vulnerability map but also quantifying various causative factors for having a geo-information system approach for developing forest fire likelihood and envisaging steps for a more focused preventive strategy. A study in this regard is available for MTR which could be extended to the whole of NER.

It is also suggested to strengthen protection strategy by having floating/ seasonal camps at vantage points; fire control center for effective communication; providing adequate mobility by procurement of 4-wheel drive jeep and motorcycles for better and efficient protection; strengthening protection infrastructure by having weapons, wireless system, uniform and accoutrements; and involving EDCs in protection and deployment of additional manpower needed for fire protection especially in more vulnerable areas.

8. Water resources conservation through conjunctive basin management
NER has many seasonal rivers with boulder beds and major portion of rain water is lost as run-off, hence, water becomes a limiting factor in the habitat utilization and wildlife distribution. Many measures have been taken by the MTR, STR and CWLS for providing access to natural water sources as well as creation of artificial water sources but NER also needs to focus on the conjunctive use of surface water and ground water resources in the water management. The ground water sources could be replenished by percolation trenches for utilization during pinch-period by tapping such aquifers.

The underground reservoirs/ resources could be identified with the help of Ground Water Board or through Remote Sensing technology or in collaboration with some research institution for developing an integrated water management and utilization plan for wildlife in NER.

9. Threats from Feral / Domestic Cattle
Most part of the NER is impacted mainly due to the presence of enclave and forest fringe villages. There are 89 villages in the ESZ of Mudumalai TR, 22 in Sarhtamanagalam TR and 165 in Cauvery North WLS causing biotic and development pressures within the NER besides other villages outside ESZ abutting the reserve.

Wildlife-related zoonosis is a diverse and complex issue. The presence of villagers' cattle including feral cattle inside the NER poses a grave threat to wild animals as they could be carriers of various viral, bacterial or parasitic diseases; besides competing for the limited grass resources. Foot & Mouth Disease (FMD) is one of the important diseases and is extremely difficult to control.
It is suggested that preventive measures should be geared towards improved disease surveillance by spatially locating such feral / domestic cattle in the NER using improved diagnostic techniques, vector control and implementation of restrictions on anthropogenic animal movement, concomitant with public enlightenment campaign.

10. Development of Community based Ecotourism including Bird Tourism
Ecotourism can be a vehicle for community-based conservation. NER has a defined ecotourism activity in the various plans (TCP/ MP/ WP) of territorial units. Places like MTR and Nilgiris already have a well-developed ecotourism within the carrying capacity and same should not be expanded any further.

It would be appropriate to involve EDCs in the commencement of community-based ecotourism (CBET) in Erode and Dharmapuri Circles through Ecotourism Management Committee (ETMC) from the proximity village; creation of low-cost green infrastructure created at the ecotourism sites; signages at the critical places; construction of interpretation centre for sensitization and creating awareness; conducting of eco-camps for the school students etc.

NER also harbors innumerable species of birds and therefore Bird watching tourism in NER has a high potential to improve the financial and environmental well-being of local communities, educate about the value of biodiversity and create incentives for successful preservation of natural areas. In this regard, Birdwatchers form a large group, and are, on average, well-educated and committed making them ideal Eco tourists for community-based conservation. It is suggested to develop check-list of the birds of NER and same could be provided for developing bird watching tourism along with acquisition of binoculars, spotting scope and development of library at Interpretation Centres.

11. Veterinary preparedness for HEC
NER has good veterinary facility for rescue of elephants and other wildlife. The captive facilities are centralized and abandoned rescued calf including conflict elephants are captured and rehabilitated in the permanent captive facility at MTR. There are also temporary captive facilities for the orphaned and conflict elephants at STR and CNWLS.

However, the response teams and other stakeholders, at HEC hotspots, are vulnerable to a variety of zoonotic disease that can be transmitted from different animals, apart from the risk that exists for disease transmission domestic animals and wildlife; and between human-domestic animals.

Veterinary capacities and infrastructure need to be upgraded, to facilitate disease monitoring in elephant populations (e.g., for anthrax, rinderpest, foot-and-mouth disease), both from an elephant conservation point of view, and from zoonotic diseases spreading to livestock and human populations. A well formulated Wildlife Health Management and Disease Surveillance Plan could be in place in every territorial unit.

12. Efficacy of HEC barriers

The efficacy of barriers has been mixed, as observed from the increase or decrease in the compensation paid by the Forest Department in areas where barriers have been created due several potential reasons such as: poor maintenance of EPTs and solar fences; EPTs are not conducive to high rainfall areas, where they routinely get filled up with rain water and many a time the sides collapse, creating tracks for elephants to easily cross over; Elephants have also figured out how to breach electric fences, by pushing trees and logs over the fences, or using their tusks and foot pads, which are poor conductors, to push and snap the wires.

Since reducing human-elephant conflict yields high benefit-cost ratios, the presence of effective barriers may therefore be a useful long-term measure for mitigating HEC. The cost of barriers should be looked at relative to their effectiveness in reducing the probability of conflict as the barriers are designed to protect a specific area; the area being protected should be the defining factor in judging their effectiveness.

It would be worthwhile to study into this aspect of barriers, as in the NER we are using from low cost EPT to moderate cost power-solar fence including hanging fence to high-cost steel rope fencing and we could accordingly arrive at the best option/ decision.

13. Zonal Master Plan for ESZ

Eco-sensitive Zone (ESZ) notification has been issued by the Government of India for Mudumalai (MTR) in 2018, Sathyamangalam (STR) and Cauvery North WLS (CNWLS) in 2019. One of the essential requirements is to prepare the Zonal Master Plan within a period of 2 years which is yet to be prepared.

As the objective of the ESZ is to create a shock-absorber around the Protected Area by creating a buffer around the PA boundary hence it's all the more important to ensure that the Zonal Plan is prepared at an earliest in consultation with the Line Departments. The propagation of Tree Cultivation as part of Agro-forestry component under ESZ could be undertaken as one of the 'promoted activities' on priority to reduce biotic and anthropogenic pressure on the adjoining forest areas.

14. Strengthening in-situ conservation across the Landscape

Nilgiri Elephant Reserve spreads over an area of 4662.45 km^2 and is located in the North-Eastern edge of the state bordering Mysuru Elephant Reserve (8055.9 km^2) of Karnataka in the North along with Wayanad (1200 km^2) and Nilambur Elephant Reserves (1419 km^2) of Kerala in the West and Coimbatore Elephant Reserve (565.5 km^2) in the South. The total area of this landscape approximates 15,903 km^2.

There are large differences in elephant densities within and between the sites which could be due to the influence of habitat (forest-grassland mosaics and riparian areas) and also on account of anthropogenic pressures including linear intrusions.

Advocacy and policy interventions are required to enable conditions for maintaining corridors and connectivity in this landscape besides strategic restoration and management of key habitats and strengthening of protection measures. To achieve the same, periodic coordination meetings would be required between the officials of this landscape and the same needs to be facilitated by the MoEF&CC.

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