



GOVT. OF INDIA

**FIFTH CYCLE, 2022  
SUMMARY REPORT**

**MANAGEMENT  
EFFECTIVENESS  
EVALUATION OF  
TIGER RESERVES  
IN INDIA**





A tiger is walking through tall, golden-brown grass in the foreground. In the background, there is a calm body of water under a clear blue sky. The tiger's stripes are clearly visible. The overall scene is peaceful and natural.

# MANAGEMENT OF TIGER EFFECTIVENESS RESERVES EVALUATION IN INDIA

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SUMMARY REPORT

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Cover Photo : Manoj Dholakia



मंत्री  
पर्यावरण, वन एवं जलवायु परिवर्तन  
और  
श्रम एवं रोजगार  
भारत सरकार



भूपेन्द्र यादव  
**BHUPENDER YADAV**

MINISTER  
ENVIRONMENT, FOREST AND CLIMATE CHANGE  
AND  
LABOUR AND EMPLOYMENT  
GOVERNMENT OF INDIA



## MESSAGE

I am delighted to inform that India has been conducting the Management Effectiveness Evaluation (MEE) of its tiger reserves using the globally accepted framework developed by IUCN's World Commission on Protected Areas since 2006. This evaluation exercise has been conducted for many years now and has provided valuable insights into the effectiveness of our conservation efforts in tiger reserves across the country. The criteria and indicators adopted for this evaluation have been specifically tailored to Indian conditions, taking into account the unique context and geographical location of each tiger reserve. The MEE score is based on a range of factors, including the performance and management of each reserve over time.

I would like to acknowledge the immense efforts put in by the Wildlife Institute of India and the National Tiger Conservation Authority, for their instrumental role in the success of this exercise. Their dedication and commitment towards safeguarding our natural resources and protecting our precious tiger population is truly commendable.

The Management Effectiveness Evaluation has played a critical role in enhancing the management of our tiger reserves. It has helped in identifying the gaps in our conservation efforts and enabled us to adopt more effective strategies for ensuring the long-term survival of these magnificent creatures. I am proud to say that our tiger reserves have shown a steady improvement in their MEE scores, indicating that our conservation efforts are bearing fruit. This is a testimony to our commitment towards protecting our natural heritage and conserving our biodiversity.

I congratulate all the team members for this endeavour.

Date: 31.03.2023

(Bhupender Yadav)

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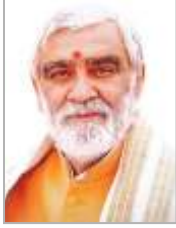


अश्विनी कुमार चौबे  
Ashwini Kumar Choubey

आहारशुद्धौ सत्त्वशुद्धिः



राज्य मंत्री  
पर्यावरण, वन एवं जलवायु परिवर्तन  
उपभोक्ता मामले, खाद्य एवं सार्वजनिक वितरण  
भारत सरकार  
MINISTER OF STATE  
ENVIRONMENT, FOREST AND CLIMATE CHANGE  
CONSUMER AFFAIRS, FOOD & PUBLIC DISTRIBUTION  
GOVERNMENT OF INDIA



## MESSAGE

India is one of the select countries in the world that have successfully not only assessed its tiger conservation efforts through the globally accepted management effectiveness framework, but has also replicated the assessment for five consecutive times (2006-2022). This assessment exercise has provided valuable insights to policy makers, conservationists and academia as to what strategies work best for ensuring long term conservation of tigers in the country.

The criteria/ indicators adopted for conducting the Management Effectiveness Evaluation (MEE) using IUCN's World Commission on Protected Areas Framework for assessing the management effectiveness of Tiger Reserves have been suitably adapted to Indian conditions. The MEE score of a tiger reserve, in addition to management, is dependent on the context and geographical location of that tiger reserve, reflecting upon the trends in its performance and management over a period of time.

India has been able to manage its Tiger Reserves effectively as is reflected by the fact that none of them fall in the poor management category and there has been a substantial improvement in the fifth cycle of assessment. This is indeed a moment of immense pride for our field formations in Tiger Reserves, the Chief Wildlife Wardens of the States, Wildlife Institute of India and the National Tiger Conservation Authority. I would like to compliment all the stakeholders for their magnificent effort and would urge them to continue striving for safeguarding our wilderness resources in general and tiger populations in particular.

(Ashwini Kumar Choubey)

## ACKNOWLEDGMENTS

We would like to thank a large number of officers and managers for providing support for the evaluation of 51 Tiger Reserves across the country.

We are grateful to the officials and staff of the National Tiger Conservation Authority (NTCA), Ministry of Environment, Forest and Climate Change (MoEF&CC) for providing technical guidance and financial assistance to accomplish this exercise.


Especially, we would like to thank the Chief Wildlife Wardens of all 18 Tiger States and Field Directors and Frontline Staff of 51 Tiger Reserves for their valuable contribution in carrying forward the Management Effectiveness Evaluation (MEE) exercise.

We express our sincere appreciation for the professional support and untiring efforts of the 10 independent teams (Chairmen and members) constituted by the NTCA for the five clusters for the evaluation of 51 Tiger Reserves in the country.

We are especially indebted to the Faculty Member and staff of the Wildlife Institute of India for their valuable support in accomplishing the task.

We would like to especially thank Dr. V.B. Mathur Former Director, Wildlife Institute of India for providing his valuable thoughts in finalizing the analysis and the summary report.

A close-up photograph of a tiger's face as it peeks through a dense thicket of tall, golden-brown grass. The tiger's eyes are focused and intense, looking directly at the viewer. The background is dark and out of focus, suggesting a natural habitat like a savanna or forest. The lighting is warm, highlighting the texture of the tiger's fur and the blades of grass.

 Nilanjan Chatterjee

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C O N T E





MANAGEMENT OF TIGER  
EFFECTIVENESS RESERVES  
EVALUATION IN INDIA

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NTS

# INTRODUCTION

Protected areas (PAs) are the cornerstone of most conservation strategies around the world. In India, under the Wildlife (Protection) Act, 1972, four legal categories of Protected Areas (PAs) have been recognised *viz.* National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves. Currently, there are 998 Protected Areas (106 National Parks, 567 Wildlife Sanctuaries, 105 Conservation Reserves and 220 Community Reserves) covering 1,73,629 km<sup>2</sup> or 5.28% of the country's geographical area (Source: WII ENVIS, 2023). Fifty three Tiger Reserves have been notified which include National Parks and Wildlife Sanctuaries of the country. The Tiger Reserve notifications are an additional layer of protection around PAs.

Protected Areas face many challenges to their integrity which, unless addressed can undermine the very objectives for which they were established. Those responsible for the conservation and management of PAs have the complex task of anticipating and dealing with these challenges, most often in an environment of limited financial and organizational capacity. It is therefore important that we invest in the efforts in the most critical areas to ensure that available resources are applied to their maximum effectiveness. Assessing the effectiveness of management and using the results for adaptive management is at the core of good PA management. Assessments enable managers and stakeholders to reflect on their experience, allocate resources efficiently and plan for effective management in relation to potential threats and opportunities (Hockings et. al. 2007). Management Effectiveness Evaluation of these sites is one important way of ensuring that the investment of time and effort in establishing and managing PAs in delivering the benefits that society seeks.

Since its inception in 2006, Management Effectiveness Evaluation (MEE) of Tiger Reserves has paved way for successfully assessing the tiger conservation efforts in the country. Since then, the Tiger Reserves has gone through repeated cycles of evaluation after every four years. The MEE exercise, adopted from International Union for Conservation of Nature and Natural Resources' (IUCN's) World Commission on Protected Areas framework, has emerged as the most significant approach to help and enhance the management perspectives of Tiger Reserves and their associated landscape connectivity. This framework includes consideration of design issues, the adequacy and appropriateness of management systems and processes and the delivery of Tiger Reserves objectives including conservation of values.

India is the only country in the world that has institutionalized the MEE process. It has successfully completed five cycles of MEE of Tiger Reserve in the country.

→	First cycle	28 Tiger Reserves	2006 (Project Tiger Directorate, 2006)
→	Second cycle	39 Tiger Reserves	2010 (Mathur et. al., 2011)
→	Third cycle	43 Tiger Reserves	2014 (Mathur et. al., 2014)
→	Fourth cycle	50 Tiger Reserves	2018 (Mathur et. al., 2019)
→	Fifth cycle	51 Tiger Reserves	2022



# TIGER RESERVES

The Tiger Reserves in India form one of the best conservation models in the world, providing habitat for biodiversity conservation and human well-being. They are the prime destinations for nature-based tourism.

The Government of India undertook an important conservation initiative by launching the 'Project Tiger' in 1973 and so far, India has declared a network of 53 Tiger Reserves spread across 18 States (Figure 1 & Table 1). Of which, a total of 51 Tiger Reserves are evaluated through MEE process encompassing a total of 73,765.57 square kilometres area; 40,787.15 square kilometres serve as the core and 32,978.42 square kilometres serve as the buffer (<https://ntca.gov.in/>) in fifth cycle of MEE of TR 2022.





Figure 1: Tiger Reserve Network in India  
(Disclaimer: Map is for reference purpose only, not to scale)

Table 1: List of 53 Tiger Reserves in India

S. No.	Tiger Reserve (TR)	State	TR Notification Year	Total Area (sq. km)
1	Nagarjunasagar	Andhra Pradesh	2007	3,296.31
2	Namdapha	Arunachal Pradesh	1987	2,052.82
3	Pakke	Arunachal Pradesh	2012	1,198.45
4	Kamlang	Arunachal Pradesh	2017	783
5	Manas	Assam	2008	2,837.10
6	Nameri	Assam	2000	464
7	Kaziranga	Assam	2007	1,173.58
8	Orang	Assam	2016	492.46
9	Valmiki	Bihar	2012	899.38
10	Indravati	Chhattisgarh	2009	2,799.07
11	Udanti Sitanadi	Chhattisgarh	2009	1,842.54
12	Achanakmar	Chhattisgarh	2009	914.02
13	Palamau	Jharkhand	2012	1,129.93
14	Bandipur	Karnataka	2007	1456.3
15	Bhadra	Karnataka	2007	1,064.29
16	Kali	Karnataka	2007	1,097.51
17	Nagarhole	Karnataka	2007	1,205.76
18	Biligiri Ranganatha Temple	Karnataka	2007	574.82
19	Periyar	Kerala	2007	925
20	Parambikulam	Kerala	2009	643.66
21	Kanha	Madhya Pradesh	2007	2,051.79
22	Pench	Madhya Pradesh	2007	1,179.63
23	Bandhavgarh	Madhya Pradesh	2007	1,536.93
24	Panna	Madhya Pradesh	2007	1,598.10
25	Satpura	Madhya Pradesh	2007	2,133.31
26	Sanjay Dubri	Madhya Pradesh	2011	1,674.50
27	Melghat	Maharashtra	2007	2,768.52
28	Tadoba Andhari	Maharashtra	2007	1,727.59
29	Pench	Maharashtra	2007	741.22
30	Sahyadri	Maharashtra	2012	1,165.57
31	Nawegaon Nagzira	Maharashtra	2013	1,894.94
32	Bor	Maharashtra	2012	816.27

S. No.	Tiger Reserve (TR)	State	TR Notification Year	Total Area (sq. km)
33	Dampa	Mizoram	2007	988
34	Satkosia	Odisha	2007	963.87
35	Simlipal	Orissa	2007	2,750.00
36	Ranthambore	Rajasthan	2007	1,411.29
37	Sariska	Rajasthan	2007	1,213.34
38	Mukundara	Rajasthan	2013	759.99
39	Ramgarh Vishdhari	Rajasthan	2022	1501.8921
40	Kalakad Mundanthurai	Tamil Nadu	2007	1,601.54
41	Annamalai	Tamil Nadu	2007	1,479.87
42	Mudumalai	Tamil Nadu	2007	688.59
43	Sathyamangalam	Tamil Nadu	2013	1,408.40
44	Srivilliputhur Megamalai	Tamil Nadu	2021	1016.57
45	Kawal	Telangana	2012	2,015.44
46	Amrabad	Telangana	2015	2,611.39
47	Dudhwa	Uttar Pradesh	2010	2,201.77
48	Pilibhit	Uttar Pradesh	2014	730.25
49	Ranipur	Uttar Pradesh	2022	529.3612
50	Corbett	Uttarakhand	2010	1288.31
51	Rajaji	Uttarakhand	2015	1075.17
52	Sunderban	West Bengal	2007	2,584.89
53	Buxa	West Bengal	2009	757.9

Note: The two recently declared Tiger Reserves viz., Ramgarh Vishdhari and Ranipur Tiger Reserves are not included in the current cycle of MEE.

# FRAMEWORK

IUCN's World Commission on Protected Areas (WCPA) provides a framework for assessing the management effectiveness of protected areas through six elements i.e. context, planning, input, process, output and outcomes (Figure 2). It begins with establishing the context of existing values and threats, progresses through planning and allocation of resources (inputs) as a result of management actions (process) and eventually produces goods and services (outputs) that result in impacts or outcomes. The elements are grouped within design/planning, adequacy and appropriateness of management systems and processes and delivery of protected area objectives including conservation of values.

In order to bring about parity in the analysis of diverse Tiger Reserves of the country and to guide the evaluators with respect to the assessments to be made, the criteria have been slightly refined since past cycles in the Technical Manual (Yadav et al. 2022). For assessment of each of the six elements of the MEE Framework, 33 criteria (Table 2) have been developed for MEE of Tiger Reserves in India. Explanatory notes on 'Criteria', wherever needed, were provided to guide the assessment process. A detailed matrix was developed and included as a part of assessment to make the scoring more objective after assigning differential weightages to different criteria/indicators. Against each 'Criteria' the evaluation team indicated appropriate 'Reference document(s)' and also provided 'Remarks'. The scores by themselves will not help in providing the complete picture unless supported by observations/ remarks that qualify such scores. This is important for the NTCA, the field managers concerned, the future of the tiger and associated species, the local people and ecosystems.

The scoring was done based on the parameters indicated in the matrix for each headline indicator. The evaluators were only allowed to choose one response and each response was assigned a score from 2.5 to 10, a score of 2.5

represented the lowest management effectiveness and rated as 'poor'; a score of 5 represented average management effectiveness and rated as 'fair'; a score of 7.5 represented the below optimal management effectiveness and rated as 'good', whereas a score of 10 represented the optimal management effectiveness and rated as 'very good'. The scores of all 33 'criteria/indicators' were pooled together for each of the 51 Tiger Reserves and a percentage rating was calculated for each Tiger Reserve. This interpretation classifies the results into four categories based on the percentage of maximum possible score: 50-59% rated as 'Fair'; 60-74% rated as 'Good'; 75-89% rated as 'Very Good' and  $\geq 90\%$  rated as "Excellent". Slight modification of these categories and the introduction of the category "Excellent" was done in order to accommodate substantial improvement (higher scores *viz.*  $\geq 90\%$ ) made by the Tiger Reserves during 5th cycle of MEE. Care was taken to ensure that these categories are comparable with previous cycles of MEE, i.e., very good category of the previous cycles was split into two categories, *viz.*, very good and excellent categories in this cycle.

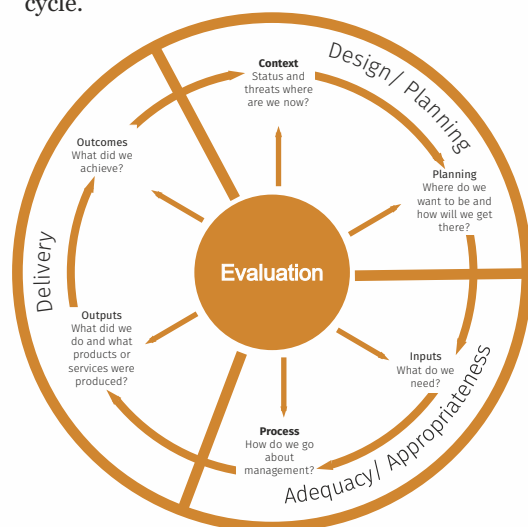


Figure 2: MEE Framework  
(Source: Hockings et al. 2008)





Table 2: List of 33 criteria/indicators adopted for fifth cycle of MEE of Tiger Reserves 2022

Element	Ind. #	Indicator Name
Context	1.1	Are the values of the Tiger Reserves (TR) well documented, assessed and monitored?
	1.2	Are the threats to TR values well documented and assessed?
	1.3	Is the 'Core Area' of TR free from human and biotic interference and the "Buffer Area" under unified Control?
	1.4	Has the TR complied with the four Statutory Requirements (SR) along with Tripartite MoU and three Standard Operation Procedures (SOP)?
	1.5	Has the Action Points of Previous MEE been Addressed Substantially?
Planning	2.1	Status of Tiger Conservation Plan (TCP)?
	2.2	Does the TR safeguards the threatened biodiversity values?
	2.3	Are stakeholders given an opportunity to participate in planning process?
	2.4	Are habitat management programmes systematically planned, relevant and monitored, and contribute effectively to tiger and other endangered species conservation?
	2.5	Does the TR has an effective Protection Strategy (PS) and Security Plan and Security Audit (SA) in place?
	2.6	Has the TR been effective in the mitigation of human-wildlife conflicts?
	2.7	Is the TR integrated into a wider ecological network/ landscape following the principles of the ecosystem approach?
	2.8	Is the TR being consciously managed to prevent carbon loss and to encourage further carbon capture/ climate change mitigation?
Input	3.1	Are personnel adequate, well organized and deployed with access to adequate resources in the Tiger Reserve (TR)?
	3.2	Are resources (vehicle, equipment, building etc.) adequate, well organized and managed with desired access?
	3.3	Are financial resources other than those of the State linked to priority actions and are funds adequate, released timely and utilized?
	3.4	Are financial resources from the State linked to priority action and funds adequate, timely released and utilized for the management of Tiger Reserve?
	3.5	What level of resources are provided by Donors other than government sources?
Process	4.1	Does the TR have manpower resources trained in wildlife conservation for effective TR management?
	4.2	Is TR staff management performance linked to achievement of management objectives?
	4.3	Is there effective public participation in TR management+ and does it show in making a difference?
	4.4	Is there a responsive system for handling complaints and comments+ about TR management?
	4.5	Does TR management address the livelihood issues+ of resource dependent communities, especially of women?
	4.6	Has the TR planned and implemented creation of inviolate zone by means of voluntary Village Relocation and phasing out of tourism from the Core/ Critical Tiger Habitat (CTH)?
Output	5.1	Is adequate information on TR management publicly available?
	5.2	Are visitor services and facilities appropriate and adequate?
	5.3	Are research/ monitoring related trends systematically evaluated and routinely reported and used to improve management?
	5.4	Is there a systematic maintenance schedule and funds in place for management of infrastructure/assets?
Outcome	6.1	Are populations of threatened species declining, stable or increasing?
	6.2	Is the population of tigers showing a declining, stable or increasing trend?
	6.3	Have the threats+ to the TR being reduced/ minimized? Or is there an increase?
	6.4	Are the expectations of visitors+ generally met or exceeded?
	6.5	Are local communities supportive of TR management?



# ASSESSMENT PROCESS

Fifth cycle of assessment covers 51 Tiger Reserves. Newly declared Tiger Reserves (Ramgarh Visdhari and Ranipur) have not been included in the current cycle of MEE, as they are in the process of finalisation of their statutory documents. Ten Independent Regional Expert Committees (REC) were constituted, deputed in 5 different clusters of five tiger landscapes to evaluate the 51 Tiger Reserves of the country (Table 3). Each team comprised of a Chairman and 2-3 Members (retired IFS Officers having experience of wildlife management, especially in the field of Tiger Reserve/ Protected Area Management). In addition, a Faculty Member from the Wildlife Institute of India (WII) was a part of the team and provided technical support in carrying out the exercise.

Prior to commencement of the exercise, an expert committee constituted by the NTCA deliberated upon the past MEE exercises in the Tiger Reserves and a Technical Manual (Version 2022) (Yadav et al. 2022) was developed. A briefing session (Inception Workshop) for the evaluators was conducted at New Delhi in June 2022.

As a part of the exercise, the Field Directors submitted a self-assessment form with all relevant supporting documents by July 2022. The Independent Expert MEE teams visited all 51 Tiger Reserves for conducting MEE as per the prescribed assessment criteria and completed the MEE Score Card after cross checking the supportive documents submitted by the Field Directors. All efforts were made to ensure that the 3-member Independent Expert MEE teams visit the tiger reserves together and spend at least three days per site. The Chairman of the respective committees compiled and submitted the reports to the Wildlife Institute of India and NTCA after completion of field visit of assigned TRs. In addition to the site reports the Chairman also submitted a 2-page report on each site covering Introduction of the TR, (a) Management Strengths; (b) Management Weaknesses; and (c) Immediate Actionable Points. The reports submitted by the MEE team were also reviewed internally by in-house experts on Tiger Reserve Management in the country. An interaction meeting was organized by NTCA on March 15, 2023 to finalise the report in which the Field Directors of Tiger Reserves and MEE teams participated along with the NTCA officers.



Table 3: 10 Independent Regional Expert Committees in 5 Clusters

Team/ Cluster	Tiger Reserve	Chairperson	Member	WII Faculty
1a	Corbett Rajaji Melghat Dudhwa Pilibhit	Sh. Brij Kishor Singh	Dr. Anup Kumar Nayak Sh. Surendra Kumar Sh. Sanjay Srivastava	Dr. Salvador Lyngdoh
1b	Pench (MH) Tadoba-Andheri Bor Sahyadri Navegaon-Nagzira	Sh. B.S. Bonal	Sh. Pawan Kumar Sharma Dr. Sandeep Tripathi Sh. Shailesh Prasad	Dr. Gautam Talukdar
2a	Bhandhavgarh Kanha Mukundra-Hills Satpura	Sh. Azam Zaidi	Dr. Pradeep Vyas Sh. Shailendra K. Singh	Sh. Qamar Qureshi, Dr. Kausik Banerjee
2b	Pench (MP) Panna Sariska Ranthambhore Sanjay-Dubri	Sh. A.V. Joseph	Dr. Bipin Behari Sh. Pradeep Kumar Dr. Rajeev K. Srivastava	Dr. Parag Nigam
3a	Valmiki Indravati Achanakmar Udanti-Sitanadi NSTR	Sh. R.N. Mehrotra	Sh. N.K. Vasu Dr. H.S. Upadhyaya Sh. Rupak De	Dr. Gopi G.V.
3b	Similipal Satkosia Kawal Amrabad Palamau	Sh. DNS Suman	Dr. Nitin Kakodkar Dr. R.K.Singh	Dr. Bilal Habib
4a	Bandipur BRT Periyar Nagarhole Bhadra Kali (Dandeli-Anshi)	Sh. U.M. Sahai	Sh. Pawan Kumar Sh. Ak Misra Sh. Yogesh	Dr. K. Ramesh
4b	KMTR Srivilluputhur- Megalamai Parambikulam Annamalai Mudumalai Sathyamanglam	Sh. S.S. Srivastava	Sh. M.S. Negi Sh. Alok Kumar	Sh. Dr. Vishnupriya Kolipakam
5a	Namdapha Kamlang Kaziranga Pakke Manas	Dr. Anil Kumar Bhardwaj	Dr. Subrat Mukherjee Sh. Prashant Kumar	Dr. R. Suresh Kumar
5b	Buxa Sundarbans Nameri Orang Dampa	Sh. B.K Patnaik	Sh. Ajai Misra Sh. G. Harikumar	Dr. Abhijit Das



# RESULTS

The results of fifth cycle of MEE of Tiger Reserves in 2022 indicate a mean score of 77.92% (ranging between 50% to 94%) for 51 Tiger Reserves (Table 4).

A total of 12 Tiger Reserves have achieved 'Excellent' category, followed by 20 Tiger Reserves in 'Very Good' category, 14 Tiger Reserves in 'Good' category and 5 Tiger Reserves in 'Fair' category (Figure 3).

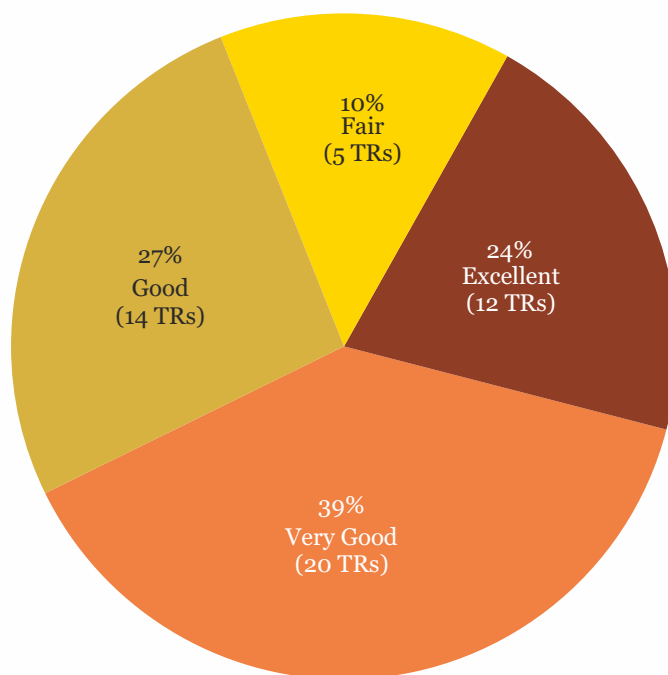
Table 4: Landscape clusters and MEE scores

Landscape	Name of Tiger Reserves	Number of Tiger Reserves	Mean MEE Score (%)	Ratings
Shivalik Gangetic Plain Landscape	Corbett, Rajaji, Dudhwa, Pilibhit, Valmiki	5	74.7	Very Good- 3; Good- 2
Central Indian and Eastern Ghats Landscape	Satpura, Kanha, Pench (MH), Similipal, Pench (MP), Tadoba-Andhari, Melghat, Navegaon-Nagzira, Bandhavgarh, Panna, NSTR, Amrabad, Sahyadri, Bor, Satkosia, Kawal, Ranthambhore, Sanjay -Dubri, Achanakmar, Palamau, Sariska, Mukundara Hills, Udanti-Sitanadi, Indravati	24	77.54	Excellent - 4 Very Good- 11; Good- 7; Fair- 2
Western Ghats	Kali, Parambikulam, Periyar, Anamalai, KMTR, Bhadra, Nagarhole, Bandipur, Mudumalai, Sathyamangalam, SMTR, BRT Hills	12	87.32	Excellent - 8 Very Good- 3; Good- 1
Northeastern Hills and Brahmaputra Landscape	Sundarbans, Manas, Buxa, Orang, Dampa, Kaziranga, Nameri, Pakke, Namdapha, Kamlang	9	68.43	Very Good- 2; Good- 4 Fair- 3
Sundarbans Landscape	Sundarban	1	75.76	Very Good-1
		<b>51 TRs</b>		





**Figure 3:** Percentage of Tiger Reserves under different categories as observed during 5th cycle of MEE 2022



Periyar in Kerala (MEE score 94.38%), Satpura in Madhya Pradesh and Bandipur in Karnataka (MEE score 93.18%), and Nagarhole in Karnataka (MEE score 92.42%) reported top three MEE score in 2022 cycle (Table 5).

Table 5: Score and rating of Individual Tiger Reserves

Name of Tiger Reserve	MEE Score %	Category
1. Periyar	94.38	Excellent (12 Tiger Reserves)
2. Satpura	93.18	
3. Bandipur	93.18	
4. Nagarhole	92.42	
5. Kanha	91.67	
6. Biligiri Ranganatha Swamy Temple (BRT Hills)	91.67	
7. Anamalai	91.67	
8. Pench (MH)	90.91	
9. Bhadra	90.91	
10. Kali (Dandeli-Anshi)	90.30	
11. Similipal	90.15	
12. Mudumalai	90.15	

Name of Tiger Reserve	MEE Score %	Category
13. Pench (MP)	88.09	Very Good (20 Tiger Reserves)
14. Tadoba-Andhari	87.88	
15. Manas	85.61	
16. Melghat	84.85	
17. Sathyamangalam	84.85	
18. Parambikulam	84.09	
19. Kaziranga	84.09	
20. Navegaon-Nagzira	83.33	
21. Bandhavgarh	83.33	
22. Panna	83.33	
23. Kalakad-Mundanthurai	83.33	
24. NSTR	82.58	
25. Dudhwa	81.82	
26. Corbett	78.79	
27. Sahyadri	78.79	
28. Amrabad	78.79	
29. Bor	78.03	
30. Pakke	77.27	
31. Sundarbans	75.76	
32. Satkosia	75.00	
33. Kawal	74.24	Good (14 Tiger Reserves)
34. Ranthambhore	73.91	
35. Kamlang	72.73	
36. Sanjay -Dubri	72.33	
37. Pilibhit	71.97	
38. Valmiki	71.97	
39. Achanakmar	69.70	
40. Rajaji	68.94	
41. Orang	68.18	
42. Palamau	65.91	
43. Sariska	64.15	
44. Buxa	63.64	
45. Srivilluputhur Megalamai	60.94	
46. Mukundara Hills	60.16	
47. Namdapha	57.58	Fair (5 Tiger Reserves)
48. Udanti-Sitanadi	56.82	
49. Nameri	56.82	
50. Indravati	53.79	
51. Dampa	50.00	

Rating key: 90% and above - Excellent, 75-89% - Very Good, 60-74% - Good and 50-59% - Fair

'Criteria/ indicators' under element 'Context' are best performing and scored maximum of 81.70% followed by 'Planning' that is 80.70%. Whereas the element 'Input' received least attention by Tiger Reserve Management and scored 73.10% (Figure 4).

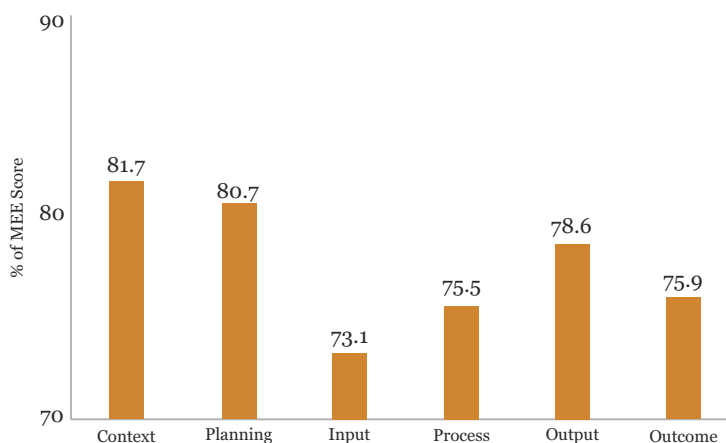


Figure 4: Mean Element-wise score (%)

Individual Tiger Reserves have been analysed element wise. Satpura Tiger Reserve (Madhya Pradesh) and Similipal Tiger Reserve (Odisha) are top performing Tiger Reserves in terms of 'Context' and received 100% score while Pench Tiger Reserve (Maharashtra), BRT Hills Tiger Reserve (Karnataka) and Manas Tiger Reserve (Assam) scored maximum in 'Planning' (Table 6). Bhadra Tiger Reserve in Karnataka is only to have received maximum scores under 'Input' while Satpura and Kanha Tiger Reserves in Madhya Pradesh and Bandipur Tiger Reserve in Karnataka scored maximum under 'Process'. Kanha Tiger Reserve in Madhya Pradesh, Nagarhole Tiger Reserve in Karnataka and Periyar Tiger Reserve in Kerala scored maximum marks under 'Output'. Mudumalai Tiger Reserve in Tamil Nadu scored 100% marks under 'Outcome'.

Table 6: Element-wise top scoring Tiger Reserves

<p><b>CONTEXT</b> 5 Questions x 10 = 50 TRs scored maximum marks in Context Satpura TR - 50 Similipal TR - 50</p>	<p><b>PLANNING</b> 8 Questions x 10 = 80 TRs scored maximum marks in Planning Pench (MH) TR - 77.5 BRT TR - 77.5 Manas TR - 77.5</p>
<p><b>INPUT</b> 5 Questions x 10 = 50 TRs scored maximum marks in Input Bhadra TR - 50</p>	<p><b>PROCESS</b> 6 Questions x 10 = 60 Trs scored maximum marks in Process Satpura TR - 60 Kanha TR - 60 Bandipur TR - 60</p>
<p><b>OUTPUT</b> 4 Questions x 10 = 40 TRs scored maximum marks in Output Kanha TR - 40 Nagarhole TR - 40 Periyar TR - 40</p>	<p><b>OUTCOMES</b> 5 Questions x 10 = 50 TRs scored maximum marks in Outcomes Mudumalai TR - 50</p>

The results of 33 'criteria/indicators' pooled together for 51 Tiger Reserves were evaluated during fifth cycle of MEE in 2022. Integration of the Tiger Reserves in a larger landscape, compliance of statutory requirements and presence of a Tiger Conservation Plan are the best performing indicators while management of Tiger Reserves for climate change mitigation and resources provided to the Tiger Reserves by donors other than Government sources are the least performing indicators (Figure 5).

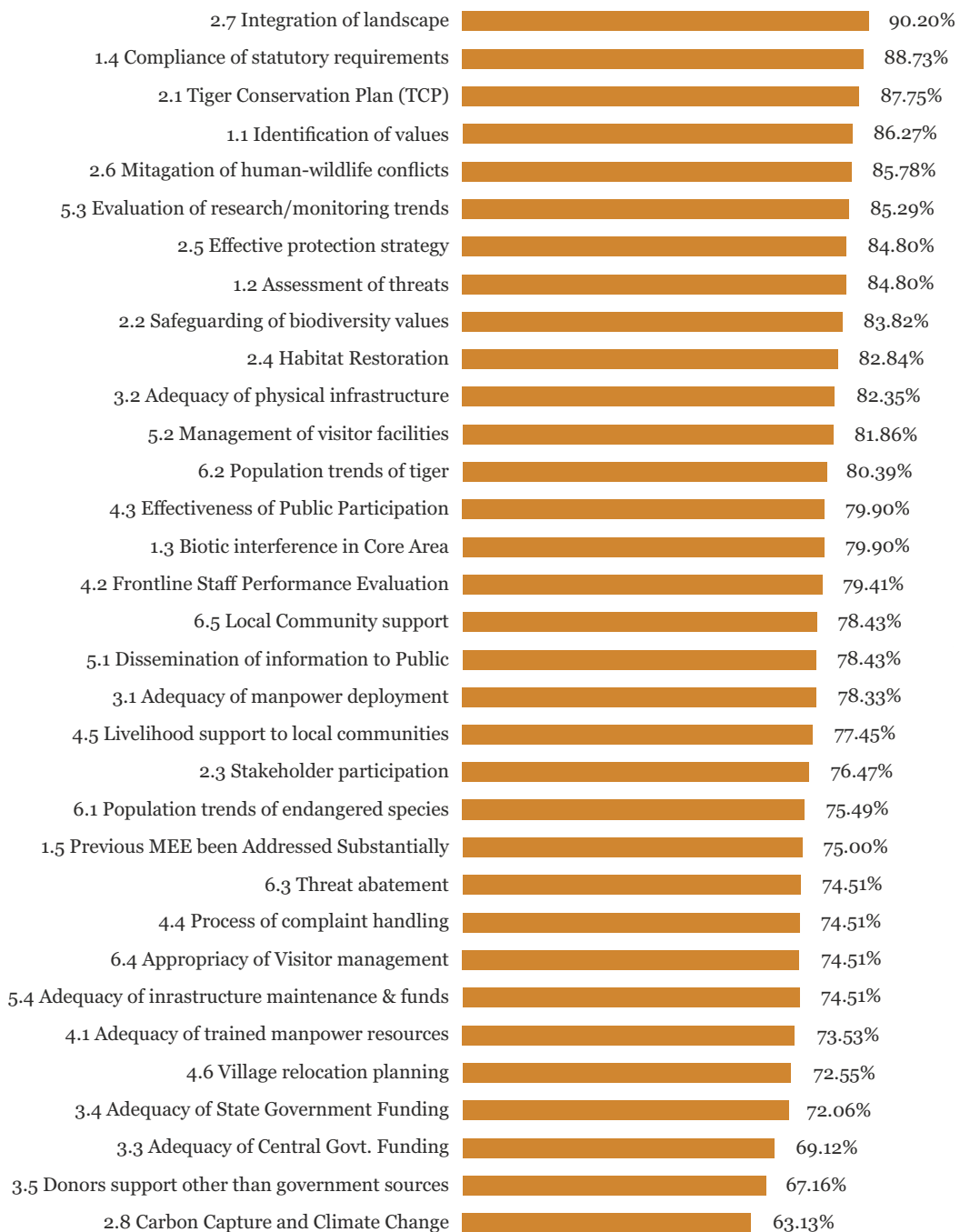
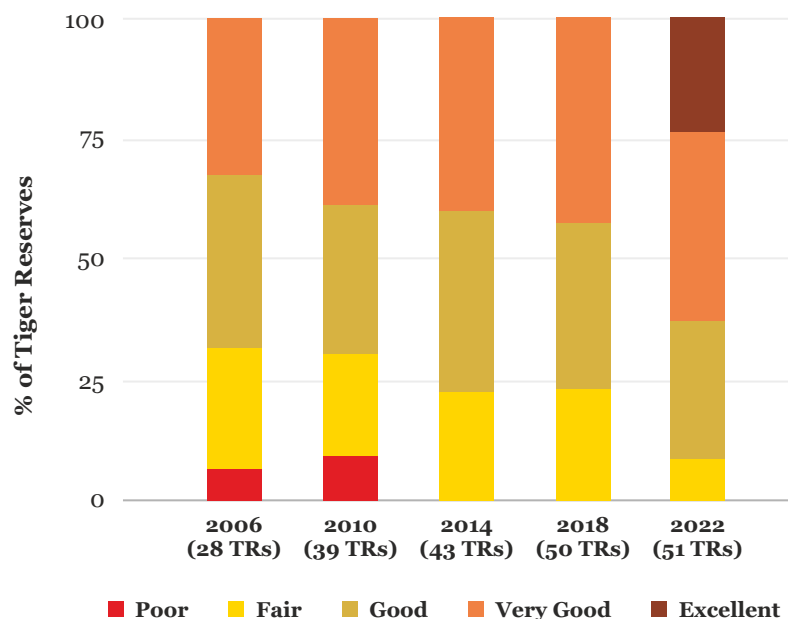


Figure 5: Performance of 33 'criteria/indicators' for 51 Tiger Reserves, evaluated in 2022

# COMPARISON WITH PREVIOUS ASSESSMENTS

There has been continuous improvement with the subsequent cycles of evaluation in MEE score of Tiger Reserves in India. The overall mean MEE score in second cycle in 2010 was 65%, 69% in third cycle in 2014, and 70% in fourth cycle of evaluation in 2018 and 77.92% in present assessment. In the 5th cycle there are 12 Tiger Reserves that have scored 90% and above and therefore a new category of **"Excellent"** has been added. (Figure 6). Substantial improvements in the subsequent cycles of MEE clearly demonstrates that there is an enhanced management efficiency in the Tiger Reserves over the years in terms of complying with the prescriptions proposed in the Tiger Conservation Plans.

Figure 6:  
Comparative  
assessment of Tiger  
Reserves in five  
cycles of MEE



A comparison of MEE TR ratings of current cycle has been made with previous cycles of evaluation. Twenty-nine Tiger Reserves have improved their category ratings, while the ratings of three Tiger Reserves have gone down (Nameri in Assam, Valmiki in Bihar and Udanti-Sitanadi in Chhattisgarh) compared with the MEE in 2018 (Table 7). Bor Tiger Reserve (Maharashtra), BRT Hills Tiger Reserve (Karnataka) and Similipal Tiger Reserve (Odisha) have shown significant improvements in the MEE ratings.



Table 7: Comparative ratings of Tiger Reserves in five cycles and change status of categories *w.r.t.* previous 2018 cycle

Cycle Year	MEE Ratings			
	2006	2010	2014	
<b>Tiger Reserves</b>	<b>28</b>	<b>39</b>	<b>43</b>	
Achanakmar	-	Fair	Fair	
Amrabad	-	-	-	
Anamalai	-	Very Good	Very Good	
Bandhavgarh	Good	Very Good	Good	
Bandipur	Good	Very Good	Very Good	
Bhadra	Good	Very Good	Good	
Biligiri Ranganatha Temple	-	-	Good	
Bor	-	-	-	
Buxa	Good	Good	Good	
Corbett	Very Good	Good	Very Good	
Dampa	Good	Good	Good	
Dandeli-Anshi	-	Very Good	Good	
Dudhwa	Very Good	Good	Good	
Indravati	Poor	Poor	Fair	
Kalakad-Mundanthurai	Fair	Very Good	Very Good	
Kamlang	-	-	-	
Kanha	Very Good	Very Good	Very Good	
Kawal	-	-	Fair	
Kaziranga	-	Very Good	Good	
Manas	Fair	Good	Good	
Melghat	Very Good	Good	Very Good	
Mudumalai	-	Very Good	Very Good	
Mukundara Hill	-	-	Fair	
Nagarhole	Good	Good	Very Good	
Nagarjunsagar-Srisaïlam	Fair	Good	Good	
Namdapha	Fair	Fair	Fair	
Nameri	Good	Fair	Fair	
Navegaon-Nagzira	-	-	-	
Orang	-	-	-	
Pakke	Fair	Good	Good	
Palamau	Very Good	Poor	Fair	
Panna	Very Good	Very Good	Very Good	
Parambikulam	-	Very Good	Very Good	
Pench (MH)	Good	Good	Very Good	
Pench (MP)	Very Good	Very Good	Very Good	
Periyar	Good	Very Good	Very Good	
Pilibhit	-	-	-	
Rajaji	-	-	-	
Ranthambhore	Fair	Good	Good	
Sahyadri	-	Fair	Good	
Sanjay-Dubri	-	Fair	Good	
Sariska	Poor	Fair	Good	
Sathyamangalam	-	-	Good	
Satkosia	-	Poor	Fair	
Satpura	-	Very Good	Very Good	
Similipal	Very Good	Fair	Fair	
Srivilliputhur-Megamalai	-	-	-	
Sundarbans	Very Good	Very Good	Very Good	
Tadoba-Andhari	Good	Good	Very Good	
Udanti-Sitanadi	-	Poor	Fair	
Valmiki	Fair	Fair	Very Good	



		Change Status <i>w.r.t.</i> 2018
2018	2022	
<b>50</b>	<b>51</b>	
Good	Good	-
Good	Very Good	↑
Very Good	Excellent	↑
Good	Very Good	↑
Very Good	Excellent	↑
Very Good	Excellent	↑
Good	Excellent	↑↑
Fair	Very Good	↑↑
Good	Good	-
Very Good	Very Good	-
Fair	Fair	-
Very Good	Excellent	↑
Good	Very Good	↑
Fair	Fair	-
Very Good	Very Good	-
Fair	Good	↑
Very Good	Excellent	↑
Good	Good	-
Very Good	Very Good	-
Good	Very Good	↑
Very Good	Very Good	-
Very Good	Excellent	↑
Fair	Good	↑
Very Good	Excellent	↑
Good	Very Good	↑
Fair	Fair	-
Good	Fair	↓
Very Good	Very Good	-
Good	Good	-
Good	Very Good	↑
Fair	Good	↑
Very Good	Very Good	-
Very Good	Very Good	-
Very Good	Excellent	↑
Very Good	Very Good	-
Very Good	Excellent	↑
Fair	Good	↑
Fair	Good	↑
Fair	Good	↑
Good	Very Good	↑
Good	Good	-
Fair	Good	↑
Very Good	Very Good	-
Good	Very Good	↑
Very Good	Excellent	↑
Good	Excellent	↑↑
-	Good	-
Good	Very Good	↑
Very Good	Very Good	-
Good	Fair	↓
Very Good	Good	↓

# HIGHLIGHTS

- **The fifth cycle of assessment in 2022 has reported an overall increase of 8% in mean MEE Score (77.92%) in comparison to fourth cycle of MEE TR assessment 2018 (70%).**
- **Twelve TRs have secured the MEE score of 90% and above and have been included in "Excellent" category.**
- **There is no Tiger Reserve rated in the "Poor" category in the 5th cycle of MEE TR assessment.**
- **Tiger Reserves like Panna and Sariska that had lost all their tigers earlier, are now performing well.**
- **There were five Tiger Reserves- Udanti-Sitanadi, Indravati, Palamau, Similipal and Nagarjunasagar - Srisailem, which were categorised in the 'Red Corridor' due to extremist issues, are now performing well.**
- **The MEE Assessment 2022 indicates that most of the Tiger Reserves are well integrated within the forested landscapes and have complied with statutory requirements such as declaration of buffer zone and tiger conservation plans.**
- **A matrix-based scoring was introduced in the current MEE cycle for the first time. It promotes an evidence-based assessment of the Tiger Reserves in the country.**



# THE WAY AHEAD

Kunming-Montreal Global Biodiversity Framework adopted in 2022, includes 23 targets aimed at reversing habitat and species loss, including the reduction of environmentally harmful subsidies, committing to quantifiable funding targets, and protecting 30% of the planet by 2030. Target 3, known colloquially as "30x30," calls for 30% of the world's terrestrial, inland water, and of coastal and marine areas, to be in effective protection and management by 2030. MEE exercises of Tiger Reserves have clearly demonstrated that our Tiger Reserves, are in consonance with 30x30 target, are effectively being conserved and managed through ecologically representative, well-connected and equitably governed systems of protected areas and other effective area-based conservation measures, recognizing indigenous and traditional territories, where applicable, and integrated into wider landscapes.

The Tiger Reserves are natural heritage, which have been valued in the past; the present and their core values should be passed down to the future generations to come. Therefore, emphasis must be given in documenting their natural heritage values both in the Tiger Conservation Plans (TCPs), and in the MEE exercise.

The headline indicator; 'carbon capture and climate change' has received the lowest score in the current cycle, the reason being, there is no mandate in the TCP for it. All the Tiger Reserves play a significant role in carbon sequestration and climate change mitigation. Therefore, a separate climate change plan heading can be included in the TCP.

In the current cycle, element 'Input' has received the lowest score. Decline in 'input' is a matter of concern; in the long run it can affect the elements 'Process', 'Output' and 'Outcomes'. Attention must be given to 'Input', so that it remains steady in all the Tiger Reserves, thereby aiding in their efficient management.

MEE of Tiger Reserves shows that they are a perfect example of effectively managed landscapes. The best scoring Tiger Reserves can be considered for green listing under IUCN Greenlist Programme. The process of MEE for assessment of Tiger Reserves in the country provides valuable insights into the management processes and practices and India should take a lead to extend this management tool to other Asian countries for effective management of their protected areas/tiger reserves.



# CONCLUSION

- **The 5th Cycle of MEE of Tiger Reserves has provided excellent insights into the operations of Tiger Reserve Network (TRN) in the country, both in qualitative as well as quantitative terms.**
- **The TRN has multiple 'Strengths' which need to be maintained and even enhanced to a higher trajectory of excellence.**
- **The 'Weaknesses' of the TRN indicated in the evaluation have to be effectively addressed in a time sensitive manner.**
- **The 'Immediate Actionable Points have to be acted upon, for which both NTCA Head Quarter and its Regional Offices have to play an important role.**

There is a need to initiate TRN - wide actions on the following aspects:

1. Development and implementation of 'Capacity Enhancement and HR Development Plan for the Frontline Staff including enhancement of Manpower Resources'.
2. Assessment of carbon sequestration potential of TRN and implementation of activities to promote carbon - neutrality.
3. Development and Implementation of Habitat Enhancement Plan with a focus on Invasive Alien Species, Water Conservation and Fire Management.
4. Prevention, Control and Management of Zoonotic Diseases and Development of Wildlife Health Infrastructure.

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