MANAGEMENT EFFECTIVENESS EVALUATION OF NATIONAL PARKS AND WILDLIFE SANCTUARIES IN INDIA

PROCESS & OUTCOMES

2018-2019

Ministry of Environment, Forest and Climate Change

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

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Cover Photo
Irfan Wani, IFS

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WII is an Autonomous Institution of the Ministry of Environment, Forest and Climate Change, Government of India, established in 1982. WII is an internationally acclaimed Institution, which offers training program, academic courses and advisory in wildlife research and management. The Institute is actively engaged in research across the breadth of the country on biodiversity related issues.

Project Investigator
Dr. Gautam Talukdar,
Scientist-E & Head, Dept. of Protected Area Network, WII

Project Co-Investigator
Dr. Monali Sen, IFS
Scientist-E, Department of Protected Area Network, WII

Project Advisors
Dr. Dhananjai Mohan, Director, WII
Dr. V.B. Mathur, Former Director, WII

Project Scientist
Dr. Nasim Ahmad Ansari, Project Scientist, WII

Editorial Support
Shri P.C. Tyagi, Senior Professional Fellow, WII
Dr. A.K. Bhardwaj, Senior Professional Fellow, WII
Dr. A.K. Gupta, Senior Professional Fellow, WII
Dr. Asha Rajvanshi, Senior Professional Fellow, WII
Dr. Nehru Prabhakaran, DST Inspire Faculty, WII
Dr. Bindu Raghawan, Professional Fellow, WII
Dr. Niraj Kakati, Technical Officer, UNESCO C2C, WII
Dr. Kaushik Banerjee, Project Scientist, WII
Dr. Vineet Dubey, Project Scientist, WII
Dr. Divya Ramesh, Project Scientist, WII
Dr. Rishi Kumar, Project Scientist, WII
Dr. Ayan Sadhu, Senior Biologist, WII

GIS and Database Support
Dr. Panna Lal, GIS & IT Cell, WII
Dr. J.S. Kathyat, Protected Area Database Cell
Mr. Lekhnath Sharma, Protected Area Database Cell
Ms. Alka Aggarwal, GIS & IT Cell, WII

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Prakash Javadekar
Union Minister
Ministry of Environment,
Forest and Climate
Government of India

सत्यमेव जयते

प्रकाश जावड़ेकर
केन्द्रीय मंत्री
पर्यावरण, वन एवं जलवायु
परिवर्तन मंत्रालय
भारत सरकार

MESSAGE

Management Effectiveness Evaluation (MEE) has emerged as a key instrument for Protected Area and is increasingly being used by governments and international bodies to understand the strengths and weaknesses of the protected area management systems. I am pleased to state that India is amongst the few countries globally that have institutionalized the MEE process and has taken a lead in evaluating its National Parks. Wildlife Sanctuaries and Tiger Reserves.

India has successfully completed evaluation of management effectiveness of 146 National Parks and Wildlife Sanctuaries in 2018-19. The results of present assessment are encouraging with overall mean MEE score of 62.01% ranging from 26.66% to 84.17%. We have successfully completed one full cycle of evaluating all National Parks and Wildlife Sanctuaries of the country. Over the years, the outcomes of MEE process have demonstrated that despite all odds, India's PA management is effective in meeting conservation goals.

Despite the threats and challenges faced by PAs in India, their critical role in fulfilling conservation goals cannot be undermined. Opportunities for enhancing management effectiveness through good governance have to be further strengthened. In order to better institutionalize the MEE process, there is a need to enhance the participation of a range of relevant stakeholders, disseminate the findings and bring in appropriate changes in policy, governance and management to enhance effectiveness of management of PAs. I encourage our field managers to actively participate in this process, which has been adapted and customized according to the needs and ground realities of Protected Area management and conservation in India.

I congratulate the Wildlife Division of our Ministry, Chief Wildlife Wardens of the States/UTs and the Protected Area managers and frontline staff for their participation and inputs. Last but not the least I compliment the Director, Wildlife Institute of India and his team for technical inputs in the MEE process and making an important contribution from India to the global best practices in PA management.

(PRAKASH JAVADEKAR)

Date: 31.12.2020

Babul Supriyo
Union Minister of State
Ministry of Environment,
Forest and Climate
Government of India

सत्यमेव जयते

स्वच्छ भारत
एक कदम स्वच्छता की ओर

बाबुल सुप्रिया
केन्द्रीय राज्य मंत्री
पर्यावरण, वन एवं जलवायु
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भारत सरकार

MESSAGE

Protected Areas (PAs) are effective tools used for wildlife conservation around the world. Improving the management of PAs has become a priority globally. India is one of the forerunner in this endeavor and has formally initiated the process of Management Effectiveness Evaluation (MEE) in 2006 for evaluation of its National Parks, Wildlife Sanctuaries and Tiger Reserves. This process has proved to be useful in strengthening the PA management and dealing with critical issues and challenges.

The present MEE exercise included 146 National Parks and Wildlife Sanctuaries in five regions viz Northern, Southern, Eastern, Western and North-eastern, covering 29 states and Union Territories of India. The overall mean MEE score is 62.01% with a range from 26.66% to 84.17%. Rating-wise, 13% PAs are in 'very good' category, 52% PAs are in 'good' category, 29% PAs in 'fair' category and only 6% PAs have been rated in 'poor' category. With this round of evaluation, we have completed one full cycle of all National Parks and Wildlife Sanctuaries.

I would like to express my appreciation to our park managers and field staff for their sustained efforts in protection and management of PAs. I also urge them to seek guidance and take up actions to improve and adapt management strategies and actions according to evolving needs and challenges in the field. I thank the Director, Wildlife Institute of India and his team as well as all the independent evaluators who have contributed for successfully completing the MEE process.

(Babul Supriyo)

Office: 5th Floor, Akash Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi-110 003
Tel. : (+91) 11-24621921/22 ● Fax : (+91) 11-24695313
Cell : (+91) 9811777143, 9810711980
E-mail : mos4ef.cc@gmail.com

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We would like to specially thank to Chief Wildlife Wardens of all States & Union Territories and all the park managers and frontline staff of 146 protected areas for their valuable contribution in carrying forward the complete cycle of Management Effectiveness Evaluation (MEE) process and specially for the 2018-19 exercise.

We express our sincere appreciation for the professional support and untiring efforts of the Independent teams (Chairman's and members) constituted by the MoEFCC for the five regions- Northern, Southern, Eastern, Western & North-eastern for the evaluation of national parks and wildlife sanctuaries (2018 to 2019).

We are also indebted to the faculty and staff of the Wildlife Institute of India for their valuable support in accomplishing the task.

Director
Wildlife Institute of India

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CHAPTER ONE

INTRODUCTION

1.1 Introduction

Harbouring protected and conserved areas have long been a successful management practice to conserve biodiversity and without them the global loss of biodiversity would be even greater. Declaration of National Parks and Wildlife Sanctuaries (NP&WLS) are the basis of protecting biodiversity, safeguarding ecosystem health and providing various ecosystem services; they store more than 15% of the global terrestrial carbon stock, help reduce deforestation, habitat and species loss, and support the livelihoods of over one billion people. There are 2,38,563 terrestrial and inland water protected areas recorded in the World Database on Protected Areas (WDPA), covering almost 7% of the global ocean and terrestrial protected areas covering just under 15% of global land and spread in 245 countries and territories (UNEP-WCMC, IUCN and NGS 2018).

India's major portion of biodiversity are being safeguarded as Protected Areas (PAs). India has systematically designated its PAs in four legal categories viz. National Parks, Wildlife Sanctuaries, Conservation Reserves and Community Reserves under Wildlife (Protection) Act, 1972 and as per this Act, India have setup 903 formally designated PAs with the total coverage 1,65,012.65km2 (5.02% of the countries geographical area). Among 903 PAs, 101 National Parks, 553 Wildlife Sanctuaries, 86 Conservation Reserves and 163 Community Reserves (as on 1st January, 2020). The National Parks and Wildlife Sanctuaries are presently the categories being subjected to evaluation through management effectiveness evaluation (MEE) process.

In recent years there has been a general concern amongst PA professionals and the public that many NP&WLS are failing to achieve their objectives and, in some cases, are actually losing the values for which they were established (Hockings et al. 2008). As a result, improving the effectiveness of PA management has become a priority throughout the conservation community. Protected areas that are effectively managed generally lead to improved biodiversity outcomes. However, only 20% (21,743 NP&WLS) of the total coverage of protected areas reported in the WDPA has been assessed for management effectiveness according to the Global Database on Protected Areas Management Effectiveness (UNEP-WCMC, IUCN and NGS 2018). The result indicated that only 17.5% of the countries have achieved the 60% score of management effectiveness (Coad et al. 2015).

1.2 What is Management Effectiveness Evaluation (MEE)?

Protected area (PA) management effectiveness evaluation (MEE) is defined as the assessment of how well NP&WLS are being managed—primarily, whether they are protecting their values and achieving the goals and objectives agreed upon. The term 'management effectiveness' reflects three main themes of PA management:

- Design issues relating to both individual sites and PA systems
- The adequacy and appropriateness of management systems and processes
- Delivery of the objectives of NP&WLS, including conservation of values.

Broadly speaking, MEE can:

- ✓ Enable and support an adaptive approach to management
- ✓ Assist in effective resource allocation
- ✓ Promote accountability and transparency
- ✓ Help involve the community and build constituencies
- ✓ Promote the values of NP&WLS.

Evaluation of PA management effectiveness did not gain real momentum until after the issue was highlighted at the 1992 World Parks Congress, in Caracas, Venezuela. Since then, more than 40 methodologies have been developed and applied to the assessment of the management effectiveness of NP&WLS (Leverington et al. 2008). In response to these initiatives, work on management effectiveness assessment has become an increasingly common component of PA management worldwide.

1.3 Why do we need evaluation or/ and assessment?

The need to evaluate PA management effectiveness has become increasingly well recognised internationally over the last one and a half decades. Assessment of management effectiveness has emerged as a key tool for PA managers and is increasingly being required by governments and international bodies. For example, the Convention on Biological Diversity (CBD) Programme of Work for Protected Areas calls on all State Parties to continue to expand and institutionalize management effectiveness assessments to work towards assessing 60% of the total area of NP&WLS using various national and regional tools and report the results into the global database on management effectiveness maintained by the World Conservation Monitoring Centre of the United Nations Environment Programme (http://www.cbd.int/decision/cop/?id=12297).

In both developed and developing countries it has been seen that declaration of NP&WLS does not always result in adequate protection (Hockings and Phillips 1999, Hockings et al. 2000, Ervin 2003). Evaluation is therefore necessary because NP&WLS face many threats. However, evaluation is not simply a way of looking for problems; it is also important to identify the best practices. Assessment of management effectiveness should include both issues within and/or beyond the control of individual managers. This approach facilitates a range of responses to threats and deficiencies in management, from site-based actions to broad political and policy reviews (Hockings et al. 2000).

There are many reasons why people want to assess management effectiveness (Hockings et al. 2000). These different purposes may require different assessment systems and varying degrees of detail. Funding bodies, policy makers and conservation lobbyists may use the results to highlight problems and to set priorities, or management agencies may use them to promote better management policies and practices. Managers may wish to use the results of evaluations to improve their performance or to report on achievements to senior managers, the government or external stakeholders (Hockings et al. 2006). Local communities and other stakeholders, including civil society, need to establish how far their interests are being taken into account. The increased emphasis on evaluation is in part due to changes in society, especially the increased demand for accountability, transparency and demonstrated 'value for money' (Hockings et al. 2006).

In practice, evaluation results are usually used in more than one way. Information used by managers to improve their own performance (adaptive management) can also be drawn on for reporting (accountability) or can be used to improve the way funds and other resources are allocated either within a single reserve or across a PA system (resource allocation). Whatever purposes it may serve, evaluation should be seen primarily as a tool to assist managers in planning of their work, not as a system for watching and punishing managers for inadequate performance. Evaluation must be used positively to support managers and be seen as a normal part of the process of management planning. Nonetheless, funding agencies and other cross-sectoral linkages have a legitimate right to know whether a PA is achieving its stated objectives, and it should be recognised that evaluation findings will inevitably also be used for advocacy. Recent experiences around the world have demonstrated that involving external stakeholders in the assessment process and transparent sharing of the results of assessment can help build cooperation and support for NP&WLS (Hockings et al. 2006).

In addition to these substantive benefits, the process of assessing management effectiveness can also deliver a number of procedural benefits. Improved communication and cooperation between managers and other stakeholders is a common outcome of evaluation processes. Managers also have an opportunity to 'step back' from the day-to-day concerns of their jobs and consider the broader issues and challenges that they face in a new light. Many managers have commented that they have derived the major benefits during the process rather than from any formal report written at the end of the exercise (Hockings et al. 2006).

However, assessments should not primarily be about reporting on or judging the managers and/or frontline staff (Mathur et al. 2011). As important as reporting requirements are, assessment of management effectiveness should primarily be used to assist managers to work as effectively as possible. Monitoring threats and activities affecting a PA and using the results to manage challenges, threats and pressures are increasingly being seen as being at the core of good site management (Mathur et al. 2011). Assessments help managers and stakeholders reflect on their experience, allocate resources efficiently and plan for effective management in relation to potential threats and opportunities (Hockings et al. 2008).

1.4 The WCPA Framework for Assessing Management Effectiveness

Over thetwo decades, numerous assessment systems have been developed, most based at least to some extent on the WCPA Framework. They vary from simple questionnaire-type approaches suitable for individual NP&WLS, through workshop-style approaches aimed at whole PA systems, to detailed monitoring systems. The approach described here is a fairly detailed monitoring and evaluation system, suitable for sites of particular importance (Hockings et al. 2008).

The precise methodology used to assess effectiveness differs between NP&WLS and depends on factors such as the time and resources available, the importance of the site, data quality and stakeholder pressures. The differing situations and needs for NP&WLS thus require different methods of assessment. As a result, a number of assessment tools have been developed to guide and record changes in management practices.

A uniform theme has been provided to these assessments by the IUCN World Commission on Protected Areas (WCPA) Framework for Assessing the Management Effectiveness of Protected

Areas (Figure 1.1 and Table 1.1), which aims both to give overall guidance in the development of assessment systems and to encourage basic standards for assessment and reporting.

The WCPA Framework for Assessing Management Effectiveness is a system for designing PA management effectiveness evaluations with six elements: context, planning, inputs, processes, outputs and outcomes. It is not a methodology but is a guide for developing assessment systems. Evaluation of management effectiveness is generally carried out by assessing a series of criteria (represented by carefully selected indicators) against agreed objectives or standards.

The WCPA Framework sees management as a process or cycle with six distinct stages, or elements:

- ✓ 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.

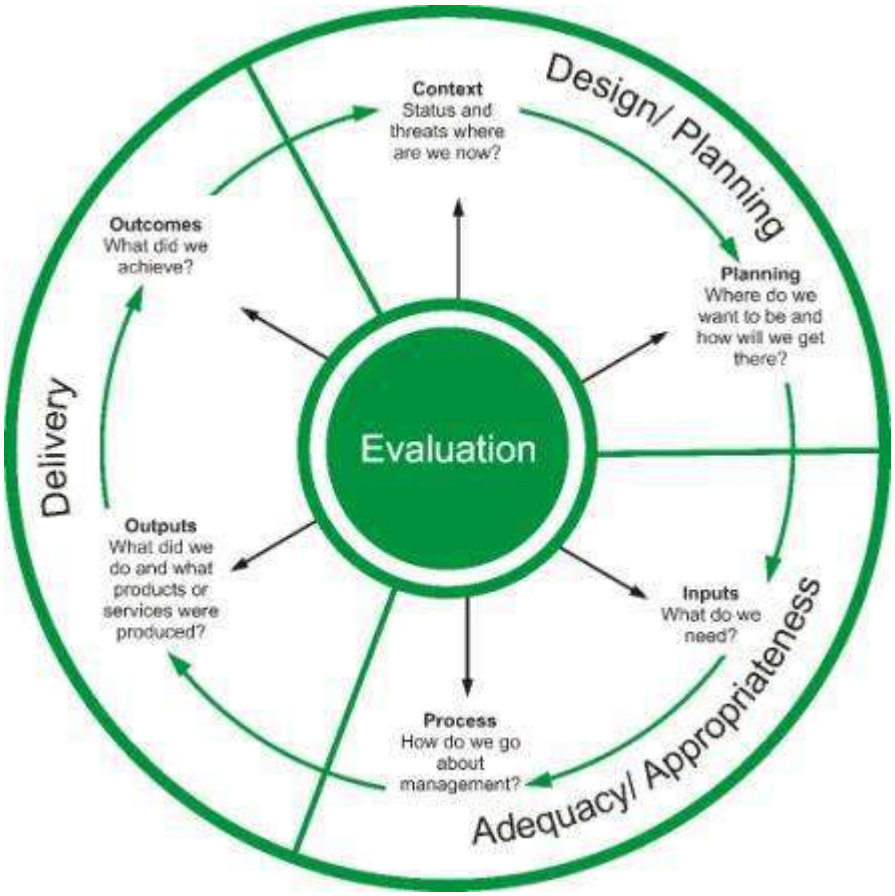

Figure 1.1 The WCPA Framework for Assessing Management Effectiveness (Source Hockings et al. 2006).

Table 1.1: Summary of the WCPA Framework (Source: Stolton et al. 2007)

Elements of evaluation	Explanation	Criteria that are Assessed	Focus of evaluation
Context	***Where are we now?*** Assessment of importance, threats and policy environment	- Significance - Threats - Vulnerability - National context - Partners	Status
Planning	***Where do we want to be?*** Assessment of protected area design and planning	- Protected area legislation and policy - Protected area system design - Reserve design - Management planning	Appropriateness
Inputs	***What do we need?*** Assessment of resources needed to carry out management	- Resourcing of agency - Resourcing of site	Resources
Processes	***How do we go about it?*** Assessment of the way in which management is conducted	- Suitability of management processes	Efficiency and appropriateness
Outputs	***What were the results?*** Assessment of the implementation of management programmes and actions; delivery of products and services	- Results of management actions - Services and products	Effectiveness
Outcomes	***What did we achieve?*** Assessment of the outcomes and the extent to which they achieved objectives	- Impacts: effects of management in relation to objectives	Effectiveness and appropriateness

Of these elements, the outcomes most clearly indicate whether the site is maintaining its core values, but the outcomes can also be the most difficult element to measure accurately. However, the other elements of the framework are all also important for helping identify particular areas where management might need to be adapted or improved.

1.5 India's experience on Management Effectiveness Evaluation (MEE) exercise

India is among the select countries in the world that have institutionalized the MEE Process. India has made a beginning in evaluating the management effectiveness of its world heritage sites, national parks, wildlife sanctuaries and tiger reserves in 2006 (Mathur 2008). Under India's Project Tiger, management effectiveness assessment of 28 TRs in 2006, 39 TRs in 2010, 43 TRs in 2014 and 50 TRs in 2018 was carried out. Three Natural World Heritage sites in South Asia, namely Keoladeo National Park, Rajasthan, Kaziranga National Park, Assam and Chitwan National Park, Nepal were evaluated in 2002-2007. The national parks and wildlife sanctuaries which are notified under Indian Wildlife (Protection) Act, 1972 are subjected to evaluation through global MEE framework. Till 2018, MEE of 324 national parks and wildlife sanctuaries

was carried out. In 2018-19, the MoEFCC with the technical assistance from Wildlife Institute of India has conducted the MEE of 146 NPs and WLS presented in this report. This 146 list also includes the 25 NP&WLS which was first evaluated in 2005-06 and now under repeat cycle of evaluation. The abstract of MEE exercises conducted in India from 2006 to till date is given in Table 1.2.

MEE process has provided valuable insights into management processes and practices of our NP&WLS. MEE process has given us management strengths, weaknesses & actionable points of NP&WLS and efforts are now needed to take action on 'Actionable points'. Critical issues like capacity building of frontline staff, preparation of management plans through participatory process, providing adequate resources, building collaboration with stakeholders and strengthening ecodevelopment programmes for communities need immediate attention.

Table 1.2: Abstract of MEE Exercises conducted in India

S.No.	Type of Approach	Application in India
1.	In-depth, Evidence based assessment WORLD HERITAGE SITES	03 World Heritage Sites (2003-2008) MEE of Chitwan world Heritage Site, Nepal MEE of Keoladeo World Heritage Site, Rajasthan, India MEE of Kaziranga World Heritage Site, Assam, India
2.	Comprehensive system-wide, Peer-based assessment TIGER RESERVES NETWORK	MEE of 28 Tiger Reserves (2006): completed MEE of 39 Tiger Reserves (2010): completed MEE of 43 Tiger Reserves (2014): completed MEE of 50 Tiger Reserves (2018): completed
3.	Rapid Expert-based scorecard NATIONAL PARKS AND WILDLIFE SANCTUARIES	MEE of 125 NP&WLS from 2006-2014: report published in 2015 MEE of 80 NP&WLS in 2015-2017: report published in 2017 MEE of 119 NP&WLS in 2017-18: report released in February, 2019 MEE of 146 NP&WLS in 2018-19: completed and presented in this report

1.6 Assessment Process for National Parks and Wildlife Sanctuaries in India, 2018-2019

The assessment process of India's National Park and Wildlife Sanctuaries adopted from IUCN WCPA framework of MEE. The 30 'Headline Indicators' developed under 6 Elements of MEE framework suitable in Indian context for evaluation. Each 'Headline Indicator' had four possible answers, 'poor' (score 2.5), 'fair' (score 5), 'good' (score 7.5) and 'very good' (score 10) to choose for evaluation.The total score would be 300 by including maximum score of all questions. The ratings assigned in four categories, as Poor – upto 40%; Fair - 41 to 59%; Good - 60 to 74%; Very Good – 75% and above. Considering the growing importance of addressing issues relating to Climate Change, Carbon Capture, Preventing Carbon Loss and encouraging further Carbon Capture in NP&WLS, two additional criteria have been developed. These criteria were not included in the formal MEE process but the information gathered helped to sensitize the conservation community about the significance of these issues and to plan next steps for addressing them.

The 146 National Parks and Wildlife Sanctuaries distributed in 29 State and Union territories of India, have been included for evaluation through MEE process during 2018-19. The site location of 146 National Parks and Wildlife Sanctuaries given in Figure 1.2.As MEE is an independent process and in order to ensure credibility of MEE Exercise, separate MEE Independent Regional Expert Committees (MEE Teams) have been constituted for each cycle of evaluation of National Parks and Wildlife Sanctuaries. Each team comprises of a Chairman and 2 Members having experience of more than 10-20 years especially in the field of Protected Area Management. Each team assisted by a WII faculty member for facilitating the MEE exercise. The details of each Independent Regional Expert Committee (REC) have been given in the respective reports.All efforts have been made by 4-member team, visits the PA together to ensure that there has no individual bias in evaluation. Thus, in this cycle of evaluation, MoEFCC, Govt. of India constituted 16 Independent Regional Expert Committees in 5 regions of the India *viz.,* 4 teams in Northern, 4 teams in Southern, 2 teams in Eastern, 4 teams in Western and 2 teams in North-eastern Regions (Table 1.3).A Technical Manual 'Management Effectiveness Evaluation (MEE) of National Parks and Wildlife Sanctuaries in India' was prepared by Wildlife Institute of India to guide the MEE process (Figure 1.3).

The 16 MEE teamsvisited 146 National Parks and Wildlife Sanctuaries for conducting MEE as per the prescribed assessment criteria form and completing the MEE Score Card. The MEE team visited all the assigned NP&WLS for conducting MEE as per the prescribed assessment criteria and complete the MEE Score Card. In addition to the site reports the Teams shall also send a 2-page SWOT based report on each PA covering, (a) Management Strengths; (b) Management Weaknesses and (c) Immediate Actionable Points. In some NP&WLS, one or more of the criteria and indicators not qualified for evaluation, then that question not marked or not taken into account in total score. The Management Strengths, Weaknesses and the Immediate Actionable Points in respect of each PA presented in this report. The filled in questionnaires of all 146 NP&WLS attached at the end of the report in a USB. At the end of the site visit, an interaction has been organized with Site Managers and his/her representatives and discussed the findings of the evaluation and sought the additional information/ clarifications. The Site Manager may also make a written submission to the team.

For assessment of each of the six elements of the MEE Framework, the 30 'Headline Indicators (criteria and indicators) have been developed for MEE process. Explanatory notes, wherever needed, are provided to guide the assessment process. The scores, along with observations (remarks), provide a better understanding of the situation in the site. Against each 'Criteria' the evaluation team should indicate 'Reference document(s)' and also provide 'Remarks', as appropriate. The scores by themselves will not help in providing the complete picture unless supported by considered observations (remarks) that qualify such scores.

After receipt of MEE reports from Chairpersons of MEE Committees, it has gone under editorial review at 2-levels. The first level is the correction of grammatical, punctuation and syntax errors. The second level perusal on factual errors, quality and quantity review. After reweiving these reports, a finalization and discussion meeting organized between MEE Team and State/UT Chief Wildlife Wardens and their representatives/ PA Managers. After publication of the report, a dissemination workshop organized to implement the findings of MEE.

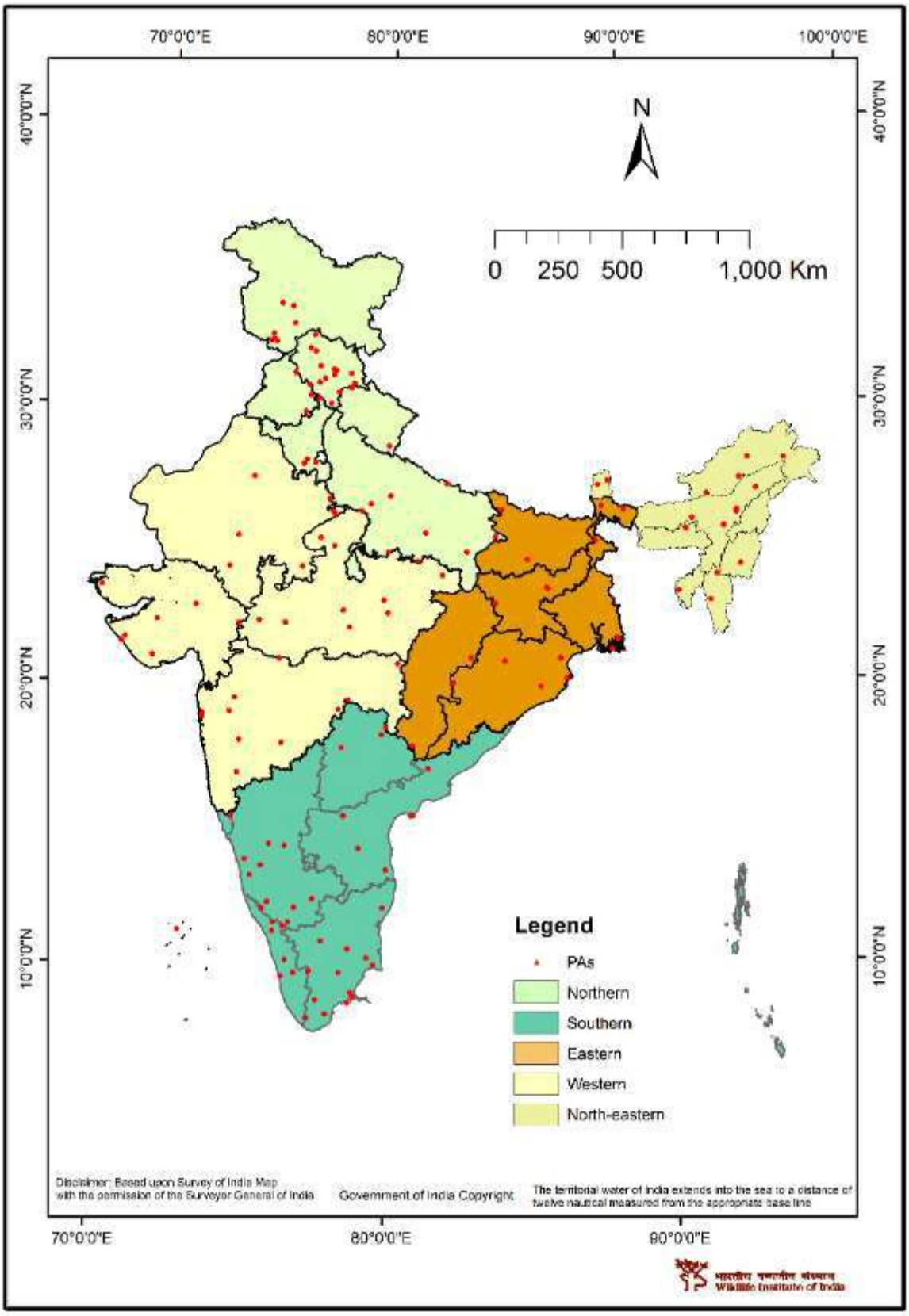

Figure 1.2: Map of India showing 146NP&WLS evaluated in 2018-19

Table 1.3 List of Regions, Teams, States and number of NP&WLS included in MEE Process 2018-19

Region	MEE Team No.	States	No. of NP&WLS
Northern	1.	Haryana Himachal Pradesh	4 7
	2.	Himachal Pradesh Jammu & Kashmir	6 3
	3.	Jammu & Kashmir Punjab	4 5
	4.	Uttar Pradesh Uttarakhand	9 2
Total	**4 Teams**	**6 States**	**40 NP&WLS**
Southern	5.	Andhra Pradesh Goa Telangana	5 1 3
	6.	Karnataka	10
	7.	Kerala	8
	8.	Tamil Nadu	11
Total	**4 Teams**	**6 States**	**38 NP&WLS**
Eastern	9.	Bihar Chhattisgarh West Bengal	2 1 5
	10.	Chhattisgarh Jharkhand Odisha	1 3 5
Total	**2 Teams**	**5 States**	**17 NP&WLS**
Western	11.	Gujarat Lakshadweep	7 1
	12.	Madhya Pradesh	9
	13.	Maharashtra	11
	14.	Rajasthan	7
Total	**4 Teams**	**5 States**	**35NP&WLS**
Norther-eastern	15.	Arunachal Pradesh Assam	4 5
	16.	Meghalaya Manipur Mizoram Sikkim Tripura	1 1 2 2 1
Total	**2 Teams**	**7 States**	**16 NP&WLS**
Total 5 Regions	**Total 16 Teams**	**29 States/UTs**	**Total 146 NP&WLS**

Management Effectiveness Evaluation (MEE) of National Parks and Wildlife Sanctuaries in India

2018-19

TECHNICAL MANUAL

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

OCTOBER, 2018

Figure 1.3: Technical Manual, MEE of NP&WLS, 2018-19

1.7 Assessment Framework and Criteria for National Parks and Wildlife Sanctuaries in India, 2018-19

1. Context

1.1 Are the values of the site well documented, assessed and monitored?

Assessment criteria*				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Values not systematically documented, assessed or monitored.	Poor			
Values generally identified but not systematically assessed and monitored.	Fair			
Most values systematically identified and assessed and monitored.	Good			
All values systematically identified and assessed and monitored.	Very good			

*Values would also include geo-morphological, historico-cultural and faunal and floral species.

1.2 Are the threats to site values well documented and assessed?

Assessment criteria*				
Condition	***Category****	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Threats not systematically documented or assessed.	Poor			
Threats generally identified but not systematically assessed.	Fair			
Most threats systematically identified and assessed.	Good			
All threats systematically identified and assessed.	Very good			

* This assessment should be based on number, nature and extent of threats. Threats within and outside PA should both be considered. Impacts, if any on the population abundance of key species may be indicated in the remarks.

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

1.3 Is the site free from human and biotic interference?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
The site has extensive human and biotic interference.	Poor			
The site has some human and biotic interference.	Fair			
The site has little human and biotic interference.	Good			
The site has no human and biotic interference.	Very good			

*This assessment should be based on 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. Number and size of human settlements/ enclaved villages and their impacts on the site may be indicated in the Remarks.

2. Planning

2.1 Is the site properly identified (NP/WLS) and categorized (in terms of zonation) to achieve the objectives?

*Assessment criteria**				
Condition	**Category+**	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Site not identified correctly or categorized.	Poor			
Site identified correctly but not categorized.	Fair			
Site identified correctly but not systematically categorized.	Good			
Site identified correctly and systematically categorized with proper zonation plans.	Very good			

*Management prescriptions for various zones (Core, Buffer, Tourism etc) may be carefully assessed.

2.2 Does the site have a comprehensive Management Plan?

*Assessment criteria**				
Condition	**Category+**	**(Tick ✓)**	**Reference document(s)**	**Remarks**
No relevant Management Plan in place.	Poor			
Management Plan exist but not comprehensive.	Fair			
Site has a comprehensive Management Plan.	Good			
Site has a comprehensive, science based Management Plan prepared through a participatory process.	Very good			

*Is the Management Plan consistent with WII Guidelines or not? The extent to which the concerns of the stakeholders, if any have been incorporated in the Management Plan may be commented upon.

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

2.3 Is the Management Plan routinely and systematically updated?

Assessment criteria				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
No process in place for systematic review and update of Management Plan.	Poor			
Management Plan sometimes updated in adhoc manner.	Fair			
Management Plan routinely and systematically updated.	Good			
Management Plan routinely, systematically and scientifically updated through a participatory process.	Very good			

2.4 Does the management plan elaborate on safeguarding the threatened biodiversity values?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
The plan does not safeguard the threatened biodiversity values.	Poor			
The plan safeguards a few threatened biodiversity values.	Fair			
The plan safeguards a large number of threatened biodiversity values.	Good			
The plan safeguards all threatened biodiversity values.	Very good			

* Remarks need to elaborate on the kind of safeguards and how they work or are intended to work

2.5 Are stakeholders given an opportunity to participate in planning?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Little, if any opportunity for stakeholder participation in planning.	Poor			
Stakeholders participate in some planning.	Fair			
Stakeholders participate in most planning processes.	Good			
Stakeholders routinely and systematically participate in all planning processes.	Very good			

* The result of participation must show in the field and not merely reported as a routine exercise. Further, is there a system/scope of putting the draft Management Plan in Public Domain in place?

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

2.6 Are habitat restoration programmes systematically planned and monitored?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Habitat restoration programmes are entirely adhoc.	Poor			
Limited planning and monitoring programmes are in place for habitat restoration.	Fair			
Habitat restoration programmes are generally well planned and monitored.	Good			
Habitat restoration programmes are thoroughly planned and monitored.	Very good			

* This assessment should be primarily based on habitat management programmes in relation to habitats for species that are threatened (IUCN categories), are habitat specialists, subjected to seasonal movements, wide ranging with emphasis on the breeding and rearing habitat and may include factors such as food, water, shelter (all connotations).Habitat structure, composition, unique patches of vegetation and sensitive sites, sources of water and their distribution are integral. Corridors within buffer zone are critically important. For example, all riparian habitats. Have these been addressed? Is their a planning process in place? What is the extent of 'invasive species in the Site? Are there any measures to reduce/ remove them? Have these been successful?

2.7 Does the site has an effective protection strategy?

*Assessment criteria**				
Condition	**Category**	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Site has no protection strategy.	Poor			
Site has an adhoc protection strategy.	Fair			
Site has a comprehensive protection strategy but is not very effective.	Good			
Site has a comprehensive and very effective protection strategy.	Very good			

* This assessment takes *inter-alia* into account the nature of threats, the number and location of patrolling camps and foot and mobile patrolling, needs that relate to available manpower, terrain difficulties, practicability of area coverage, readiness to contain specific threats with necessary support and facilities. Is there any coordination with other wings of the Forest Department/ Police/ Customs etc? Are these effective?

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

2.8 Does the management plan integrate the site into a wider ecological network/ landscape following the principles of the ecosystem approach?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
The plan does not integrate the site into a wider network/ landscape.	Poor			
The plan makes some limited attempts to integrate the site into a network/ landscape.	Fair			
The plan integrates the site generally quite well into a network/ landscape.	Good			
The plan fully integrates the site into a wider network/ landscape.	Very good			

* Assessment needs to consider the scope of opportunities on the landscape scale that exist. Consider whether any attempts have been made and what are these? Have all the important corridors been identified? What actions are planned/implemented for their security? Have the Forest Working Plans and Forest Development Corporation Plans within the identified landscapes taken cognizance of such new requirement? What kind of relationship exists with the District Administration and other Line Departments? Does the Site get any funds from these agencies?

3. Inputs

3.1 Are personnel adequate, well organised and deployed with access to adequate resources in the site?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Few, if any, personnel explicitly allocated for PA management.	Poor			
Some personnel explicitly allocated for PA management but not systematically linked to management objectives.	Fair			
Some personnel explicitly allocated towards achievement of specific management objectives.	Good			
Adequate personnel explicitly allocated towards achievement of specific management objectives.	Very good			

* This assessment should *inter-alia* be based on number of personnel allocated for attainment of PA objectives at the Range , Round, Beat and Patrolling camps levels or as relevant to the needs (sanctioned posts *vis- a- vis* existing personnel and needs beyond the sanctioned strengths. It is possible that posts have last been sanctioned several years back that do not now account for the current needs)

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

3.2 Does the site have trained manpower resources for effective PA management?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Very few trained officers and frontline staff in the site.	Poor			
Few trained officers and frontline staff, who are posted in the site.	Fair			
A large number of trained officers and frontline staff are posted in the site.	Good			
All trained managers and frontline staff posted in the site.	Very good			

* Indicate % 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); Others.

3.3 Are resources (vehicle, equipment, building etc.) adequate, well organised and managed with access to adequateresources?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Few, if any, resources explicitly allocated for PA management.	Poor			
Some resources explicitly allocated for PA management but not systematically linked to management objectives.	Fair			
Some resources explicitly allocated towards achievement of specific management objectives.	Good			
Adequate resources explicitly allocated towards achievement of specific management objectives.	Very good			

* These form a variety of resources. These may be segregated into immovable (structures) and movable categories and each further may be considered under the essential and desirable categories. It is best to start with what are the minimum needs to attain each objective, what is available and manner of use/deployment. The proportions of the 'essentials' and 'desirables' along the importance gradient of objectives would serve as pointers for score categories. Specific remarks would be vitally important.

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

3.4 Are resources (human and financial) linked to priority actions and are funds released timely?

Assessment criteria				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Resource allocation is adhoc, funds are inadequate and seldom released in time and not utilized.	Poor			
Some specific allocation for management of priority action. Funds are inadequate and there is some delay in release, partially utilized.	Fair			
Comprehensive planning and allocation that meets the most important objectives. Generally funds released with not much delay and mostly utilized.	Good			
Comprehensive planning and allocation of resources for attainment of most objectives. Funds generally released on-time and are fully utilized.	Very good			

*Obtain details of funds released by MoEF and their utilization by site in the last 3 years and indicate them under 'Remarks'. Also comment on the problems associated with funds and their mitigation.

3.5 What level of resources is provided by NGOs?

*Assessment criteria**				
Condition*	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
NGOs contribute nothing for the management of the site.	Poor			
NGOs make some contribution to management of the site but opportunities for collaboration are not systematically explored.	Fair			
NGOs contributions are systematically sought and negotiated for the management of some site level activities.	Good			
NGOs contributions are systematically sought and negotiated for the management of many site level activities.	Very good			

*Details of contributions (cash/kind) made by the NGOs in the last 3 years may be collected.

3.6 Does PA manager considers resources (human and financial) to be sufficient?

Assessment criteria				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Resources insufficient for most tasks.	Poor			
Resources sufficient for some tasks.	Fair			
Resources sufficient for most tasks.	Good			
Resources are in excess for most tasks.	Very good			

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

4. Process

4.1 Is PA staff performance management linked to achievement of management objectives?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
No linkage between staff performance management and management objectives.	Poor			
Some linkage between staff performance management and management objectives, but not consistently or systematically assessed.	Fair			
Performance management for most staff is directly linked to achievement of relevant management objectives.	Good			
Performance management of all staff is directly linked to achievement of relevant management objectives.	Very good			

*Has the PA staff received award/ appreciation from any agency in the last 3 years?

4.2 Is there effective public participation in PA management?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Little or no public participation in PA management.	Poor			
Opportunistic public participation in some aspects of PA management.	Fair			
Systematic public participation in most aspects of PA management.	Good			
Comprehensive and systematic public participation in all important aspects of PA management.	Very good			

* Participation would include Conservation & awareness programmes, Census operations, Intelligence gathering, Forest fire control etc.

4.3 Is there a responsive system for handling complaints and comments about PA management?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
No systematic approach to handling complaints.	Poor			
Complaints handling system operational but not responsive to individual issues and limited follow up provided.	Fair			
Coordinated system logs and responds effectively to most complaints.	Good			
All complaints systematically logged in coordinated system and timely response provided with minimal repeat complaints.	Very good			

* Number of queries made and response thereof under the Right to Information (RTI), Act in the last 3 years may be compiled.
*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

4.4 Does PA management addresses the livelihood issues of resource dependent communities especially of women?

Assessment criteria				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
No livelihood issues are addressed by PA management.	Poor			
Few livelihood issues are addressed by PA management.	Fair			
Substantial livelihood issues are addressed by PA management.	Good			
Livelihood issues of resource dependent communities especially women are addressed effectively by PA managers.	Very good			

5. Output

5.1 Is adequate information on PA management publicly available?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Little or no information on PA management publicly available.	Poor			
Publicly available information is general and has limited relevance to management accountability and the condition of public assets.	Fair			
Publicly available information provides detailed insight into major management issues for most NP&WLS or groups of NP&WLS.	Good			
Comprehensive reports are routinely provided on management and condition of public assets in all NP&WLS or groups of NP&WLS.	Very good			

* Does the Site has a website? If yes, is it comprehensive, well-managed and periodically updated?

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

5.2 Are visitor services (tourism and interpretation) and facilities appropriate for the relevant protected area category?

Assessment criteria				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Visitor services and facilities are at odds with relevant PA category and/or threaten PA values.	Poor			
Visitor services and facilities generally accord with relevant PA category and don't threaten PA values.	Fair			
All visitor services and facilities accord with relevant PA category and most enhance PA values.	Good			
All visitor services and facilities accord with relevant PA category and enhance PA values.	Very good			

* Include the existence and quality of visitor and interpretation centers, including skills and capabilities of personnel manning these, site related publications, films, 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, rest rooms, garbage disposal, attended and self guided services in the field, visitor feed back 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 compiled.

5.3 Are research/ monitoring related trends systematically evaluated and routinely reported and used to improve management?

Assessment criteria				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Little or no systematic evaluation or routine reporting of trends.	Poor			
Some evaluation and reporting undertaken but neither systematic nor routine.	Fair			
Systematic evaluation and routine reporting of management related trends undertaken.	Good			
Systematic evaluation and comprehensive reporting of trends undertaken and attempts made at course corrections as relevant.	Very good			

* Not all site attract projects and researchers and with exceptions, little research takes place on the site own steam because of systemic limitations. However, monitoring of some critical issues is expected e.g. population of tiger, co-predators and prey 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 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 number of research projects in the last 3 years, institutions involved, salient outcomes may be collected and used in awarding scores.

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

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

Assessment criteria				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
No systematic inventory or maintenance schedule.	Poor			
Inventory maintenance is adhoc and so is the maintenance schedule.	Fair			
Systematic inventory provides the basis for maintenance schedule but funds are inadequately made available.	Good			
Systematic inventory provides the basis for maintenance schedule and adequate funds are made available.	Very good			

6. Outcomes

6.1 Are populations of threatened species especially key faunal species declining, stable or increasing?

*Assessment criteria**				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Threatened/ endangered species populations declining.	Poor			
Some threatened/ endangered species populations increasing, most others stable.	Fair			
Most threatened/ endangered species populations increasing, most others stable.	Good			
All threatened/ endangered species populations either	Very good			

increasing or stable.				

* This needs to practically relate to the natural ecosystem potential rather than being driven merely by numbers and visibility. The assessment score may be elaborated under remarks. Comments on the population trends may be made under Remarks.

6.2 Have the threats to the site being reduced/ minimized or is there an increase?

Assessment criteria				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Threats to the Site have not abated but have enhanced.	Poor			
Some threats to the Site have abated, others continue their presence	Fair			
Most threats to the Site have abated. The few remaining are vigorously being addressed	Good			
All threats to the Site have been effectively contained and an efficient system is in place to deal with any emerging situation	Very good			

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

6.3 Has the site been effective in the mitigation of human-wildlife conflicts?

Assessment criteria*				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Human-wildlife conflicts are rampant.	Poor			
Site has been able to mitigate few human-wildlife conflicts.	Fair			
Site has been able to mitigate many human-wildlife conflicts.	Good			
Site has been able effective in mitigating all human-wildlife conflicts.	Very good			

* Details of compensation paid for human injury/ death and property damage in the last 3 years may be collected.

6.4 Are the expectations of visitors generally met or exceeded?

Assessment criteria*				
Condition	**Category***	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Expectations of visitors generally not met.	Poor			
Expectations of many visitors are met.	Fair			
Expectations of most visitors are met.	Good			
Good expectations of most visitors are met.	Very good			

* Is there any system of receiving/ analyzing visitor feedback?

6.5 Are local communities supportive of PA management?

*Assessment criteria**				
Condition	**Category**	**(Tick ✓)**	**Reference document(s)**	**Remarks**
Local communities are hostile.	Poor			
Some are supportive.	Fair			
Most locals are supportive of PA management.	Good			
All local communities supportive of PA management.	Very good			

* There could be many reasons for disenchantment. It could be real because of managerial neglect or the managerial efforts could be appropriate but there could be local elements/organizations who would like to keep the dis-affectation simmering for their own ulterior motives. Likewise success could be entirely because of the efforts of managers or they might be fortunate in striking partnerships with credible NGOs. Assessment may take the prevailing causes into account.

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

1.8 MEE Score Card

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	03	10	30		
2.	Planning	08	10	80		
3.	Inputs	06	10	60		
4.	Process	04	10	40		%
5.	Outputs	04	10	40		
6.	Outcomes	05	10	50		
Total		**30**		**300**		

1.9 Assessment Criteria for addressing issues relating to ClimateChange & Carbon capture in the Protected Areas

1. Additional Criteria on Climate Change: Is the protected area being consciously managed to adapt to climate change?

Condition	Category*	(Tick ✓)	Comment/ Explanation	Next Steps
There have been no efforts to consider adaptation to climate change in management	Poor			
Some initial thought has taken place about likely impacts of climate change, but this has yet to be translated into management plans	Fair			
Detailed plans have been drawn up about how to adapt management to predicted climate change, but these have yet to be translated into active management.	Good			
Detailed plans have been drawn up about how to adapt management to predicted climate change, and these are already being implemented	Very good			

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

2. Additional Criteria on Climate Change: Is the protected area being consciously managed to prevent carbon loss and to encourage further carbon capture?

Condition	Category*	(Tick ✓)	Comment/ Explanation	Next Steps
Carbon storage and carbon dioxide capture have not been considered in management of the protected area	Poor			
Carbon storage and carbon dioxide capture have been considered in general terms, but has not yet been significantly reflected in management	Fair			
There are active measures in place to reduce carbon loss from the protected area, but no conscious measures to increase carbon dioxide capture	Good			
There are active measures in place both to reduce carbon loss from the protected area and to increase carbon dioxide capture	Very good			

*Score: Poor: 2.5; Fair: 5; Good: 7.5; Very Good: 10

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CHAPTER TWO

OUTCOMES OF MANAGEMENT EFFECTIVENESS EVALUATION (MEE) OF NATIONAL PARKS AND WILDLIFE SANCTUARIES IN INDIA, 2018-19

RESULTS: AT A GLANCE, MEE 2018-19

2.1 Introduction

Management Effectiveness Evaluation (MEE) of 146 National Parks and Wildlife Sanctuaries (NP&WLS) conducted during 2018-19 with the financial support from MoEFCC and with the technical support from 16 Independent Regional Expert Committees in the five regions of the country *viz*., Northern, Southern, Eastern, Western and North-eastern region. The 16 Independent Regional Expert Committees (REC) conducted field visit studies and interactions made with Park Managers and concerned State Chief Wildlife Wardens for evaluation of 146 NP&WLS in 2018-19. The committee could not have undertaken the assessments of 3 National Parks and Wildlife Sanctuaries through the MEE process *viz*., Trikuta Wildlife Sanctuary, Jammu & Kashmir, Nugu Wildlife Sanctuatry, Karnataka and Sajnakhali Wildlife Sanctuary, West Bengal. As after notification, the Trikuta WLS has not been handed over to Wildlife Division for ground verification and management, hence sanctuary not existing. Nagu WLS is part of Bandiput Tiger Reserve and Sajnakhali WLS is part of Sundarbans Tiger Reserve, evaluated separately with Tiger Reserves, hence not evaluated by this team. The MEE scoring of these 3 NP&WLS were not made by REC, however, the detail description and specific recommendations are given in next chapter.

2.2 Overall results of MEE of National Parks and Wildlife Sanctuaries, 2018– 2019

The 143 National Parks and Wildlife Sanctuaries are arranged in 5 regions including 29 States and Union Territories of India have the overall mean MEE score of 62.01% with a range from 26.66% to 84.17% MEE score (Table 2.1). Tirthan Wildlife Sanctuary and Great Himalayan National Park, Himachal Pradesh rated with the highest MEE score of 84.17% and Turtle Wildlife Sanctuary, Uttar Pradesh rated with least MEE score of 26.66%. The top five and bottom five scored NP&WLS are given in Table 2.2.

In total 11 NP&WLS (9.24%) scored in 'Very Good' category, 46 NP&WLS (38.66%) in 'Good', 56 NP&WLS (47.06%) in 'Fair' and only 6 NP&WLS (5.04%) in 'Poor' category (Table 2.5).

Table 2.1: Overall mean MEE Score and range in percentages

Regions	States/ UTs	No. of States	No. of PAs evaluated	Mean MEE Score %	MEE Score Range %
Northern *	Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Uttar Pradesh and Uttarakhand	6	39	56.00	26.66-84.17
Southern *	Andhra Pradesh, Goa, Telangana, Karnataka, Kerala and Tamil Nadu	6	37	64.22	45.83-80.00
Eastern*	Bihar, Chhattisgarh, Jharkhand, Odisha and West Bengal	5	16	66.12	40.00-81.03
Western	Gujarat, Lakshadweep, Madhya Pradesh, Maharashtra and Rajasthan	5	35	64.22	29.31-80.83
North-eastern	Arunachal Pradesh, Assam, Meghalaya, Manipur, Mizoram, Sikkim and Tripura	7	16	59.51	31.66-79.17
	Total	**29**	**143**	**62.01**	**26.66-84.17**

*Note: *Evaluation was not carried out in 1 WLS in these regions*

Table 2.2: Top five and bottom five scored NP&WLS

State	NP&WLS	%	Rating
Top five scored NP&WLS			
West Bengal	Jaldapara NP	80.83	Very Good
West Bengal	Raiganj WLS	81.03	Very Good
Himachal Pradesh	Sainj WLS	82.50	Very Good
Himachal Pradesh	Great Himalayan NP	84.17	Very Good
Himachal Pradesh	Tirthan WLS	84.17	Very Good
Bottom five scored NP&WLS			
Uttar Pradesh	Turtle WLS	26.66	Poor
Haryana	Khaparwas WLS	29.17	Poor
Rajasthan	Ramsagar WLS	29.31	Poor
Assam	Pani-Dihing Bird WLS	31.66	Poor
Uttar Pradesh	Jai Prakash Narayan (Surhatal) Bird WLS	31.67	Poor

2.3 Region-wise performance of National Parks and Wildlife Sanctuaries

The 143 National Parks and Wildlife Sanctuaries arranged in five regions viz. Northern, Southern, Eastern, Western and North-eastern for evaluation. The eastern region of India presents highest overall mean MEE Score of 66.12% and the Northern region represents the lowest mean MEE Score of 56% (Figure 2.1). The region wise highest and lowest scored NP&WLS are given in Table 2.2.

The 39NP&WLS included in Northern region, of which 3NP&WLS in 'Very Good' category, 11 in 'Good', 21 in 'Fair' and 4 in 'Poor' category of MEE rating (Table 2.3). Great Himalayan National Park, Himachal Pradesh and Tirthan Wildlife Sanctuary, Himachal Pradesh represents highest MEE score of 84.17% rated in 'Very Good' category, followed by Sainj Wildlife Sanctuary, Himachal Pradesh of 82.50% also rated in 'Very Good' category and Turtle Wildlife Sanctuary, Uttar Pradesh represents lowest MEE score of 26.66% ('poor' category) in Northern region (Table 2.4).

The 37NP&WLS included in Southern region, among which 4NP&WLS are in 'Very Good' category, 25 in 'Good' and 8 in 'Fair' category (Table 2.3). Someshwara Wildlife Sanctuary, Karnataka rated highest with 80% score in 'Very Good' category, followed by Gulf of Mannar Marine National Park, Tamil Nadu with 79.17% score in 'Very Good' category and Oussudu Lake Bird Sanctuary, Tamil Nadu rated as lowest MEE score of 45.83% in 'Fair' category in Southern region (Table 2.5).

The 16 NP&WLS included in Eastern region, among which 4 NP&WLS rated in 'Very Good' category and 9 in 'Good' and 3 in 'Fair' category (Table 2.3). Raiganj Wildlife Sanctuary, West Bengal rated highest with 81.03% score in 'Very Good' category, followed by Jaldapara Wildlife Sanctuary with 80.83% score in 'Very Goog' category and Pamed Wild Buffalo Wildlife Sanctuary, Chhattisgarh rated as lowest MEE score of 40% in 'Fair' category in Eastern region (Table 2.6).

The 35 NP&WLS included in Western region, among which 6 NP&WLS rated in 'Very Good' category, 22in 'Good', 4 in 'Fair' and 3 in 'Poor' category (Table 2.3). Pachmarhi Wildlife Sanctuary, Madhya Pradesh rated highest MEE score with 80.83% in 'Vey Good' category, followed by Kuno-Palpur Wildlife Sanctuary, Madhya Pradesh with 79.16% in 'Very Good' category and Ramsagar Wildlife Sanctuary, Rajasthan rated as 'Poor' with lowest MEE score of 29.31% in Western region (Table 2.7).

The 16 NP&WLS included in North-Eastern region, among which 2 NP&WLS rated in 'Very Good' category, 7 in 'Good', 5 in 'Fair' and 2 in 'Poor' category (Table 2.3). Nongkhyllem Wildlife Sanctuary, Meghalaya rated best PA with 79.17% in 'Very Good' category, followed by Khangchendzonga National Park, Sikkim rated in 'Very Good' category with 77.50% MEE Score and Pani-Dihing (Bird) Wildlife Sanctuary, Assam rated in 'Poor' category with least MEE score of31.66% in North-eastern region (Table 2.8).

The region-wise top two highest and lowest scored NP&WLS in five regions are given in Table 2.9.

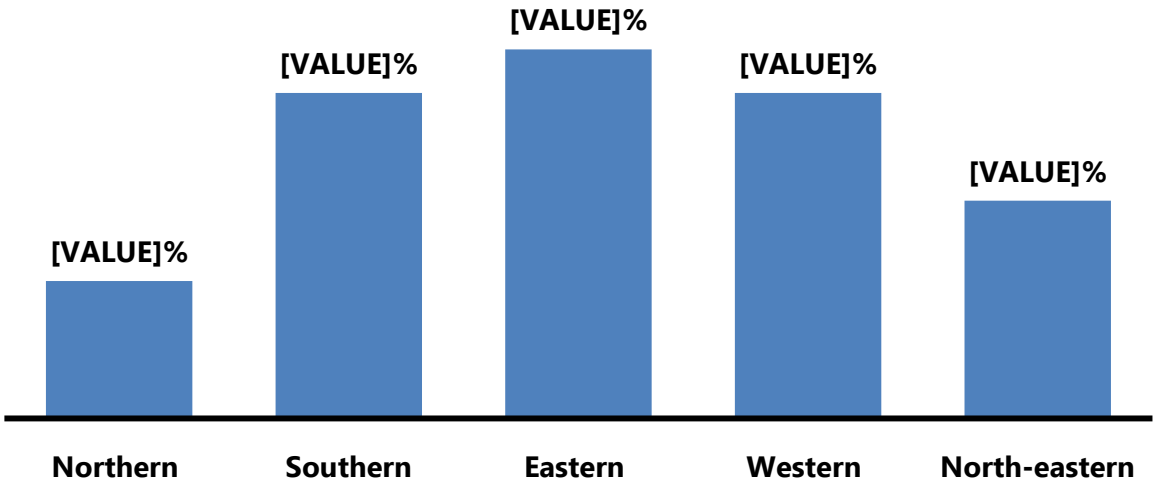


Figure 2.1: Overall Region-wise mean MEE Score

Table 2.3: Overall Region-wise MEE Ratings

Regions	No. of PAs evaluated	Very Good	Good	Fair	Poor
Northern	39	3	11	21	4
Southern	37	4	25	8	0
Eastern	16	4	9	3	0
Western	35	6	22	4	3
North-eastern	16	2	7	5	2
Total	**143.00**	**19**	**74**	**41**	**9**
	Percentage	**13.29**	**51.75**	**28.67**	**6.29**

*Note: *Rating in %: Poor – Upto 39; Fair - 40 to 59; Good - 60 to 74; Very Good - 75 and above*

Table 2.4: Individual ratings of National Parks and Wildlife Sanctuaries in descending order of percentage score of NP&WLS in Northern region

State	NP & WLS	MEE Score	MEE Rating
Himachal Pradesh	Great Himalayan NP	84.17	Very Good
Himachal Pradesh	Tirthan WLS	84.17	Very Good
Himachal Pradesh	Sainj WLS	82.50	Very Good
Himachal Pradesh	Kugti WLS	73.33	Good
Himachal Pradesh	Nargu WLS	70.00	Good
Punjab	Takhni-Rehampur WLS	68.33	Good
Punjab	Nangal WLS	65.83	Good
Punjab	Bir Motibagh WLS	65.00	Good
Haryana	Sultanpur NP	64.17	Good
Punjab	Jhajjar Bacholi WLS	64.17	Good
Himachal Pradesh	Shikari Devi WLS	62.93	Good
Himachal Pradesh	Sech Tuan Nala WLS	60.00	Good
Himachal Pradesh	Tundah WLS	60.00	Good
Jammu & Kashmir	Kishtwar NP	59.82	Good

Uttar Pradesh	National Chambal WLS	59.17	Fair
Himachal Pradesh	Majathal WLS	58.33	Fair
Punjab	Kathlaur Kushlian WLS	58.33	Fair
Jammu & Kashmir	Overa-Aru WLS	57.50	Fair
Jammu & Kashmir	Ramnagar Rakha WLS	57.50	Fair
Himachal Pradesh	Rakchham Chitkul (Sangla Valley) WLS	56.67	Fair
Himachal Pradesh	Renuka WLS	55.83	Fair
Himachal Pradesh	Talra WLS	55.17	Fair
Jammu & Kashmir	Nandni WLS	54.31	Fair
Jammu & Kashmir	Rajparian (Daksum) WLS	54.17	Fair
Uttarakhand	Nandhaur WLS	54.16	Fair
Himachal Pradesh	Lippa Asrang WLS	53.33	Fair
Jammu & Kashmir	Surinsar Mansar WLS	51.67	Fair
Uttar Pradesh	Saman Bird WLS	49.16	Fair
Uttar Pradesh	Sandi Birds WLS	48.50	Fair
Uttarakhand	Govind NP	48.33	Fair
Uttar Pradesh	Samaspur Bird WLS	46.60	Fair
Uttar Pradesh	Vijai Sagar WLS	45.83	Fair
Haryana	Bir Shikargarh WLS	45.00	Fair
Haryana	Nahar WLS	41.67	Fair
Uttar Pradesh	Sohelwa WLS	41.66	Fair
Uttar Pradesh	Ranipur WLS	39.16	Poor
Uttar Pradesh	Jai Prakash Narayan (Surhatal) Bird WLS	31.67	Poor
Haryana	Khaparwas WLS	29.17	Poor
Uttar Pradesh	Turtle WLS	26.66	Poor

Table 2.5: Individual ratings of National Parks and Wildlife Sanctuaries in descending order of percentage score of NP&WLS in Southern region

State	**NP & WLS**	**MEE Score**	**MEE Rating**
Karnataka	Someshwara WLS	80.00	Very Good
Tamil Nadu	Gulf of Mannar Marine NP	79.17	Very Good
Kerala	Thattekad Bird WLS	77.50	Very Good
Karnataka	Sharavathi Valley WLS	75.83	Very Good
Kerala	Neyyar WLS	72.50	Good
Tamil Nadu	Nellai WLS	72.50	Good
Andhra Pradesh	Krishna WLS	69.17	Good
Karnataka	Pushpagiri WLS	69.17	Good
Karnataka	Ranganathittu Bird WLS	69.17	Good
Karnataka	Talakaveri WLS	69.17	Good
Kerala	Peechi-Vazhani WLS	69.17	Good
Telangana	Pocharam WLS	68.33	Good
Kerala	Kottiyoor WLS	67.50	Good
Tamil Nadu	Theerthangal Bird Sanctuary	67.50	Good
Kerala	Wayanad WLS	66.60	Good

Kerala	Malabar WLS	66.00	Good
Andhra Pradesh	Nellapattu WLS	65.00	Good
Andhra Pradesh	Rollapadu WLS	65.00	Good
Telangana	Lanja Madugu Siwaram WLS	64.17	Good
Karnataka	Ramadevara Betta Vulture WLS	62.93	Good
Karnataka	Shettihalli WLS	62.50	Good
Karnataka	Rangayyanadurga Four-horned antelope	61.67	Good
Kerala	Kurinjimala WLS	61.67	Good
Tamil Nadu	Vedanthangal Lake Birds WLS	61.67	Good
Tamil Nadu	Vellode Birds WLS	61.67	Good
Tamil Nadu	Vettangudi Birds WLS	61.67	Good
Andhra Pradesh	Papikonda NP	60.00	Good
Karnataka	Ranebennur Black Buck WLS	60.00	Good
Tamil Nadu	Udayamarthandapuram Lake WLS	60.00	Good
Andhra Pradesh	Sri Lankamalleswara WLS	59.17	Fair
Tamil Nadu	Vaduvoor Birds WLS	59.17	Fair
Kerala	Mangalavanam Bird WLS	56.25	Fair
Telangana	Pranahita WLS	55.83	Fair
Tamil Nadu	Sakkarakottai Bird Sanctuary	51.67	Fair
Tamil Nadu	Vellanadu Blackbuck WLS	50.83	Fair
Goa	Madei WLS	50.00	Fair
Tamil Nadu	Oussudu Lake Bird Sanctuary	45.83	Fair

Table 2.6: Individual ratings of National Parks and Wildlife Sanctuaries in descending order of percentage score of NP&WLS in Eastern region

State	**NP & WLS**	**MEE Score**	**MEE Rating**
West Bengal	Raiganj WLS	81.03	Very Good
West Bengal	Jaldapara NP	80.83	Very Good
Odisha	Nandankanan WLS	79.17	Very Good
West Bengal	Haliday Island WLS	77.27	Very Good
West Bengal	Mahananda WLS	71.67	Good
Odisha	Khalasuni WLS	70.83	Good
Odisha	Bhitarkanika WLS	70.00	Good
Bihar	Pant (Rajgir) WLS	68.75	Good
Chhattisgarh	Sarangarh-Gomardha WLS	66.67	Good
Odisha	Kuldiha WLS	64.17	Good
Bihar	Udaipur WLS	63.39	Good
Odisha	Sunabeda WLS	61.67	Good
Jharkhand	Mahuadanr Wolf WLS	60.83	Good
Jharkhand	Parasnath WLS	58.33	Fair
Jharkhand	Topchanchi WLS	43.33	Fair
Chhattisgarh	Pamed Wild Buffalo WLS	40.00	Fair

Table 2.7: Individual ratings of National Parks and Wildlife Sanctuaries in descending order of percentage score of NP&WLS in Western region

State	NP & WLS	MEE Score	MEE Rating
Madhya Pradesh	Pachmarhi WLS	80.83	Very Good
Madhya Pradesh	Kuno WLS	79.16	Very Good
Madhya Pradesh	Madhav NP	76.60	Very Good
Maharashtra	Thane Creek Flamingo WLS	75.92	Very Good
Maharashtra	Sanjay Gandhi NP	75.80	Very Good
Maharashtra	Mayureswar Supe WLS	75.00	Very Good
Gujarat	Thol Lake WLS	74.16	Good
Gujarat	Paniya WLS	74.14	Good
Gujarat	Ratanmahal Sloth Bear WLS	72.50	Good
Rajasthan	Keoladeo Ghana NP	72.50	Good
Maharashtra	Yedsi Ramlin Ghat WLS	72.41	Good
Maharashtra	Sagareshwar WLS	71.50	Good
Gujarat	Rampara Vidi WLS	71.43	Good
Maharashtra	Tipeshwar WLS	70.80	Good
Madhya Pradesh	Ralamandal WLS	68.33	Good
Gujarat	Porbandar Bird WLS	67.59	Good
Madhya Pradesh	Veerangna Durgavati WLS	67.24	Good
Rajasthan	Sajjangarh WLS	67.24	Good
Rajasthan	Tal Chhapar WLS	67.24	Good
Maharashtra	Naigaon Peacock WLS	66.40	Good
Maharashtra	Yawal WLS	65.80	Good
Gujarat	Narayan Sarovar Chinkara WLS	65.50	Good
Maharashtra	Nandur Madhameshwar WLS	64.60	Good
Madhya Pradesh	Sailana WLS	64.29	Good
Maharashtra	Tungareshwar WLS	64.00	Good
Madhya Pradesh	Son Gharial WLS	63.33	Good
Maharashtra	Painganga WLS	62.06	Good
Gujarat	Barda WLS	60.00	Good
Madhya Pradesh	Singhori WLS	56.03	Fair
Madhya Pradesh	Sardarpur WLS	50.89	Fair
Lakshadweep	Pitti (Bird Island) WLS	43.48	Fair
Rajasthan	Todgarh Raoli WLS	40.52	Fair
Rajasthan	Shergarh WLS	39.17	Poor
Rajasthan	Van Vihar WLS	32.00	Poor
Rajasthan	Ramsagar WLS	29.31	Poor

Table 2.8: Individual ratings of National Parks and Wildlife Sanctuaries in descending order of percentage score of NP&WLS in North-Eastern region

State	NP & WLS	MEE Score	MEE Rating
Meghalaya	Nongkhyllem WLS	79.17	Very Good
Sikkim	Khangchendzonga NP	77.50	Very Good
Assam	Pabitora WLS	74.16	Good
Tripura	Sepahijala WLS	74.10	Good
Manipur	Keibul-Lamjao NP	73.33	Good
Mizoram	Pualreng WLS	73.21	Good
Mizoram	Thorangtlang WLS	67.86	Good
Arunachal Pradesh	Tale WLS	62.50	Good
Sikkim	Shingba Rhododendron WLS	61.20	Good
Arunachal Pradesh	Yordi Rabe Supse WLS	57.50	Fair
Arunachal Pradesh	Sessa Orchid WLS	52.50	Fair
Assam	Nambor-Doigrung WLS	48.33	Fair
Arunachal Pradesh	Mahao WLS	42.50	Fair
Assam	Nambor WLS	42.50	Fair
Assam	Marat Longri WLS	34.16	Poor
Assam	Pani-Dihing Bird WLS	31.66	Poor

Table 2.9: Top two highest and lowest scoredNP&WLS in five regions

Region	Highest Scored PA	Lowest Scored PA
Northern	1. Great Himalayan NP, H.P.- 84.17% (Very Good) 2. Tirthan WLS, H.P.- 84.17% (Very Good)	1. Turtle Wildlife Sanctuary, U.P.- 26.66% (Poor) 2. Khaparwas WLS, Haryana- 29.17% (Poor)
Southern	1. Someshwara WLS, Karnataka- 80% (Very Good) 2. Gulf of Mannar Marine NP, Tamil Nadu- 79.17% (Very Good)	1. Oussudu Lake Bird WLS, Tamil Nadu- 45.83% (Fair) 2. Madei WLS, Goa- 50% (Fair)
Eastern	1. Raiganj WLS, West Bengal- 81.03% (Very Good) 2. Jaldapara WLS, West Bengal- 80.83% (Very Good)	1. Topchanchi WLS, Jharkhand- 43.33% (Fair) 2. Pamed Wild Buffalo WLS, Chhattisgarh-40% (Fair)
Western	1. Pachmarhi WLS, M.P.-80.83% (Very Good) 2. Kuno-Palpur WLS, M.P.- 79.16% (Very Good)	1. Van Vihar WLS, Rajasthan- 32% (Poor) 2. Ramsagar WLS, Rajasthan- 29.31% (Poor)
North-eastern	1. Nongkhyllem WLS, Meghalaya- 79.17% (Very Good) 2. Khangchendzonga NP, Sikkim- 77.50% (Very Good)	1. Marat Longri WLS, Assam- 34.16% (Poor) 2. Pani-Dihing Bird WLS, Assam- 31.66% (Poor)

2.4 State-wise performance of National Parks and Wildlife Sanctuaries

The 146 National Parks and Wildlife Sanctuaries belong to 29 States and Union Territories (UTs) of India. Since MEE of 3NP&WLS of 3 States(i.e. Trikuta Wildlife Sanctuary, Jammu & Kashmir; Nugu Wildlife Sanctuary, Karnataka and Sajnakhali Wildlife Sanctuary, West Bengal) were not undertaken, excluded from the list and thereforea comparative performance of 143 NP&WLS from 29 States and UTs are discussed here. The State of Himachal Pradesh has the maximum number of NP&WLS (13 NP&WLS) followed by Tamil Nadu and Maharashtra (11 NP&WLS) evaluated in 2018-19 (Table 2.10). The mean MEE score percentage recorded maximum for Meghalaya (79.16%) and minimum for Uttar Pradesh State (43.16%) (Figure 2.2).

Table 2.10: State-wise list of NP&WLS evaluated in 2018-19 and MEE Score in percentage

S. No.	States & UT	No. of NP&WLS evaluated in 2018-19	MEE Score in Percentage
1.	Andhra Pradesh	5	63.67%
2.	Arunachal Pradesh	4	53.75%
3.	Assam	5	46.16%
4.	Bihar	2	66.07%
5.	Chhattisgarh	2	53.33%
6.	Goa	1	50.00%
7.	Gujarat	7	69.33%
8.	Haryana	4	45.00%
9.	Himachal Pradesh	13	65.88%
10.	Jammu & Kashmir	6	55.83%
11.	Jharkhand	3	54.17%
12.	Karnataka	9	67.83%
13.	Kerala	8	67.15%
14.	Lakshadweep	1	43.48%
15.	Madhya Pradesh	9	67.41%
16.	Maharashtra	11	69.48%
17.	Manipur	1	73.33%
18.	Meghalaya	1	79.17%
19.	Mizoram	2	70.54%
20.	Odisha	5	69.17%
21.	Punjab	5	64.33%
22.	Rajasthan	7	49.71%
23.	Sikkim	2	69.35%
24.	Tamil Nadu	11	61.06%
25.	Telangana	3	62.78%
26.	Tripura	1	74.10%
27.	Uttar Pradesh	9	43.16%
28.	Uttarakhand	2	51.25%
29.	West Bengal	4	77.70%
	Total	**143**	**61.52%**

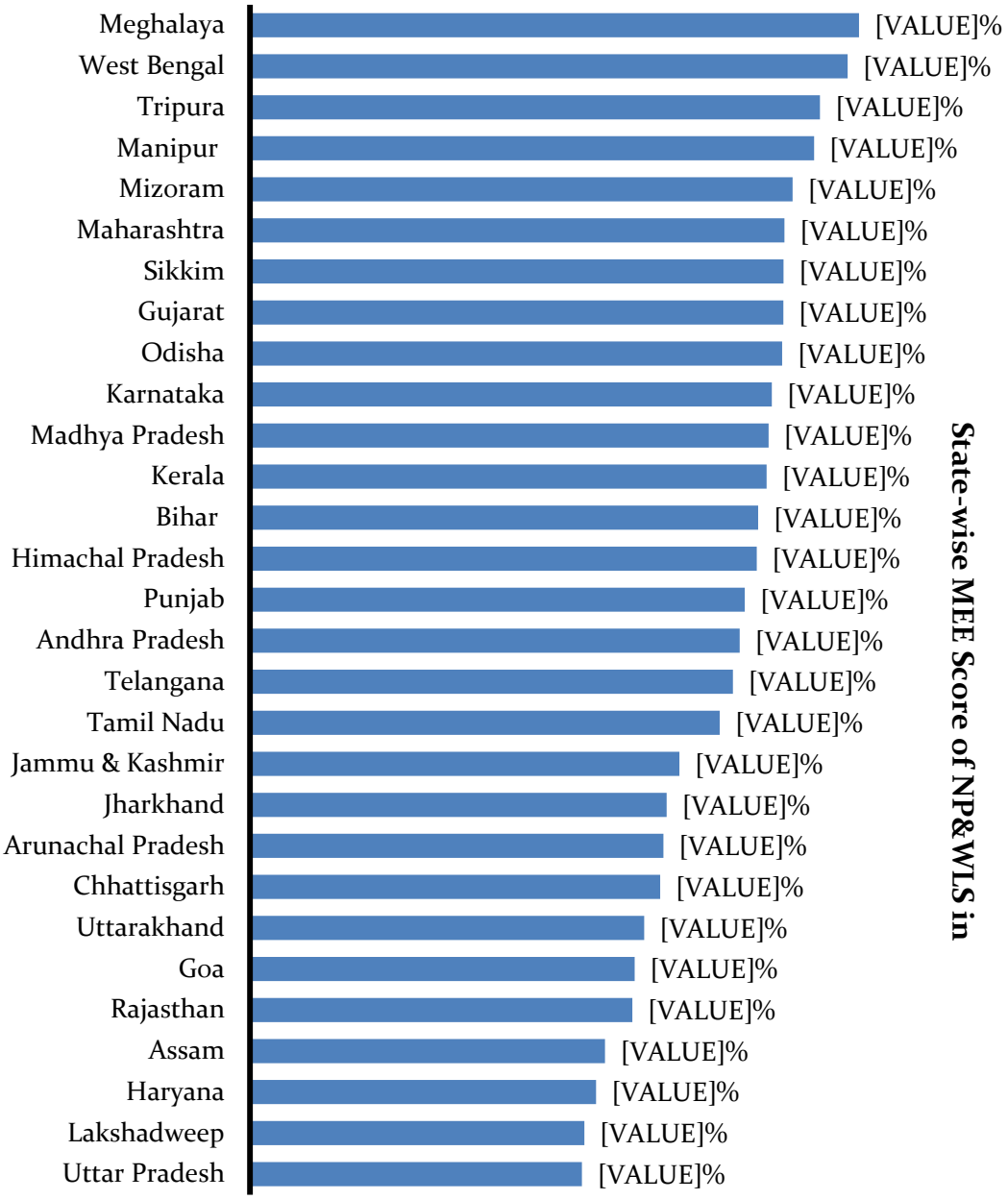


Figure 2.2: State-wise descending order of MEE score in percentage

2.5 Indicator-wise MEE performance of National Parks and Wildlife Sanctuaries

The evaluation of National Parks and Wildlife Sanctuaries in India based on the global MEE framework, which includes 6 Elements, viz., Context, Planning, Input, Process, Output and Outcomes. There are 30 'Headline Indicators' have been customised and developed in Indian context based on these 6 Elements. The element wise and indicator wise performance have been analysed. The score of 30 indicators pooled for 143NP&WLS and a comparative performance in descending order given in Figure 2.3. The indicator 'Zonation of site' is the best performing indicator followed by 'Effective protection strategy' whereas 'NGO Support' followed by 'Peoples participation' are the worst performing indicators. By analysing the score on 30 indicators of all 143 NP&WLS, the element 'Context' scored the highest rating of 67.77% whereas the 'Output' has the lowest MEE score of 55.42% (Figure 2.4).

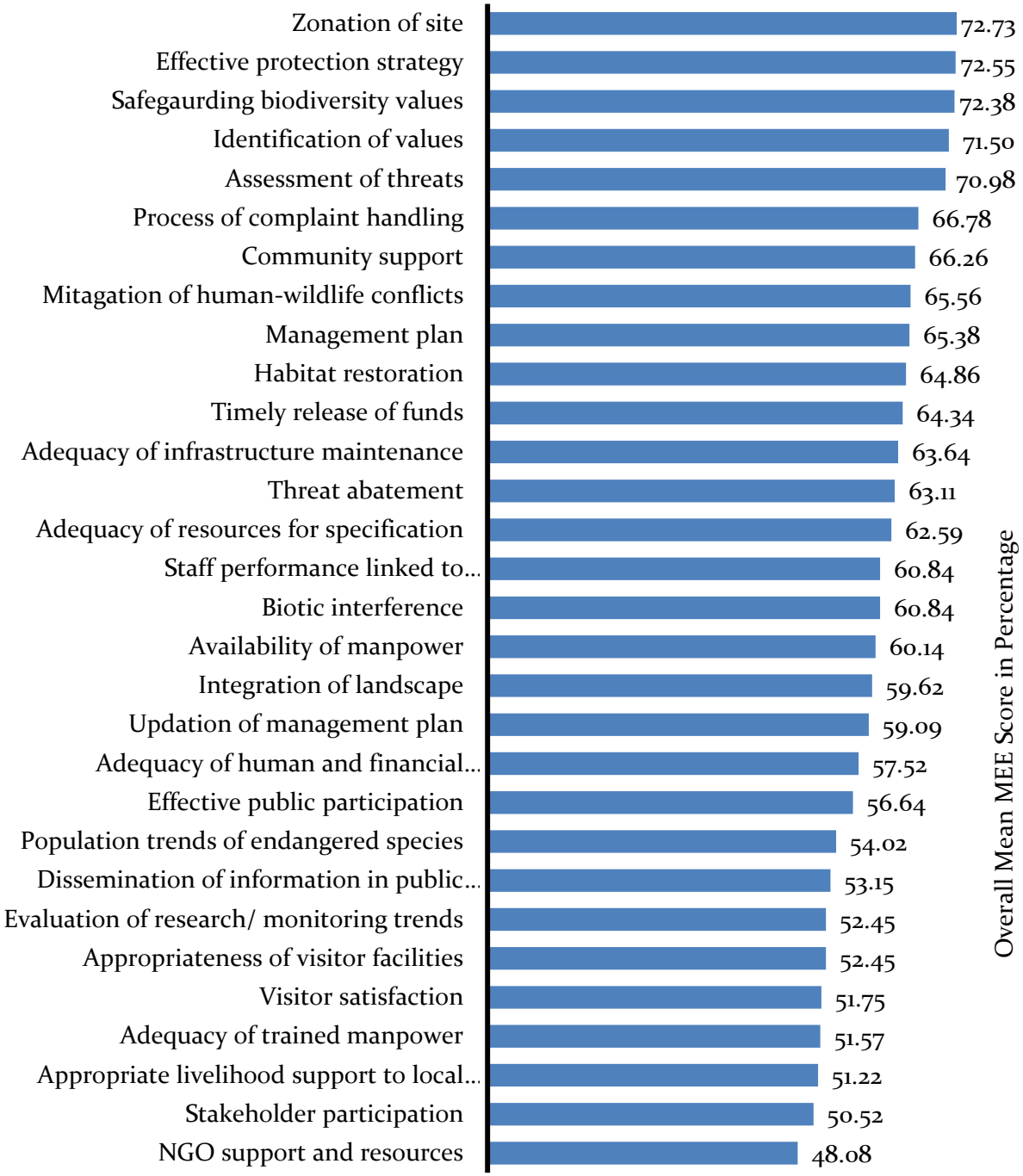


Figure 2.3: Descending order of MEE score in 'Headline Indicators'

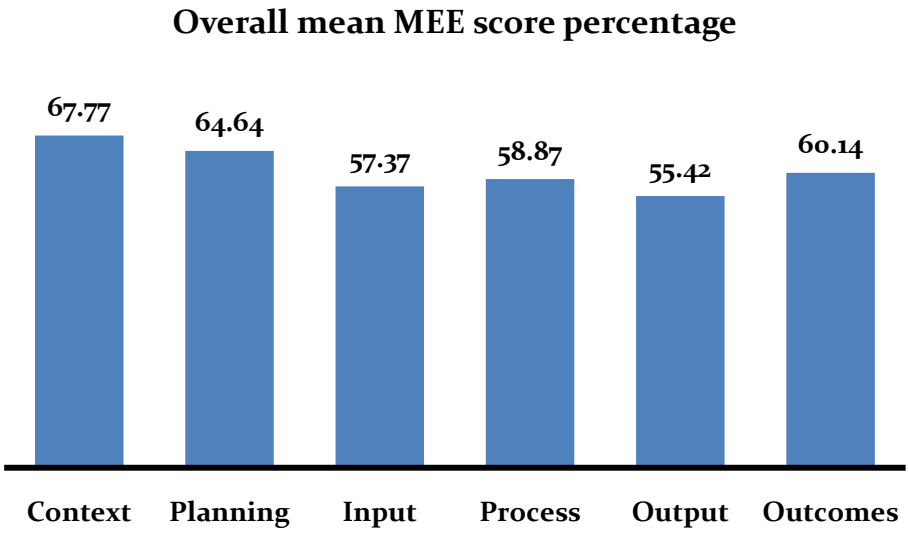


Figure 2.4: Element-wise performance of 143NP&WLS in MEE 2018-19

2.6 Trends of 25 National Parks and Wildlife Sanctuaries taken under repeat cycle of evaluation in 2018-19

With this cycle of evaluation of 146 National Parks and Wildlife Sanctuaries (NP&WLS) during 2018-19, India have completed one cycle of evaluation of all terrestrial NP&WLS. Also the list of 146 NP&WLS includes 25 NP&WLW in repeat cycle of evaluation. These 25 NP&WLS were first evaluated in 2006 and again evaluated in second repeat cycle during 2018-19. In comparision to previous cycle of evaluation, there is considerable imprpovement in most of the NP&WLS (19 NP&WLS), however, 4 NP&WLS have shown declining trend and two NP&WLS have shown similar trends. The site-wise trends given in the Table 2.11.

Table 2.11: Trends of 25 NP&WLS included in second repeat cycle of evaluation

State	NP&WLS	2006		2018-19		Change Status
		Score (%)	Rating	Score (%)	Rating	
Andhra Pradesh	Papikonda NP	45.50	Fair	60.00	Good	↑
Arunachal Pradesh	Sessa Orchid WLS	71.20	Good	52.50	Fair	↑
Assam	Pobitora WLS	77.30	Very Good	74.16	Good	↓
Gujarat	Barda WLS	56.10	Fair	60.00	Good	↑
Haryana	Sultanpur NP	56.10	Fair	64.17	Good	↑
Himachal Pradesh	Great Himalayan National Park	76.50	Very Good	84.17	Very Good	↑
Jammu & Kashmir	Kishtwar NP	47.70	Fair	59.82	Good	↑
Jharkhand	Mahauadanr WLS	42.40	Fair	60.83	Good	↑
Kerala	Wayanad WLS	59.10	Fair	66.60	Good	↑
Madhya Pradesh	Kuno-palpur WLS	58.30	Fair	79.16	Very Good	↑
Madhya Pradesh	Madhav NP	51.50	Fair	76.60	Very Good	↑

Maharashtra	Sanjay Gandhi NP	62.10	Good	75.80	Very Good	↑
Manipur	Keibul Lamjao NP	73.50	Good	73.33	Good	No change
Meghalaya	Nongkhyllem WLS	72.00	Good	79.17	Very Good	↑
Odisha	Sunebeda WLS	58.30	Fair	61.67	Good	↑
Odisha	Bhitarkanika WLS	70.50	Good	70.00	Good	No change
Rajasthan	Keoladeo NP	75.00	Very Good	72.50	Good	↓
Sikkim	Khangchendzonga NP	72.00	Good	77.50	Very Good	↑
Tamil Nadu	Gulf of Mannar Marine NP	57.60	Fair	79.17	Very Good	↑
Tripura	Sepahijala WLS & Clouded Leopard NP Sepahijala	66.00	Good	74.10	Good	↑
Uttar Pradesh	National Chambal WLS	56.10	Fair	59.17	Fair	↑
Uttar Pradesh	Sohelva WLS	49.20	Fair	41.66	Fair	↓
Uttarakhand	Govind Pashu Vihar WLS	52.30	Fair	48.33	Fair	↓
West Bengal	Mahananda WLS	63.60	Good	71.67	Good	↑
West Bengal	Jaldapara WLS	76.50	Very Good	80.83	Very Good	↑

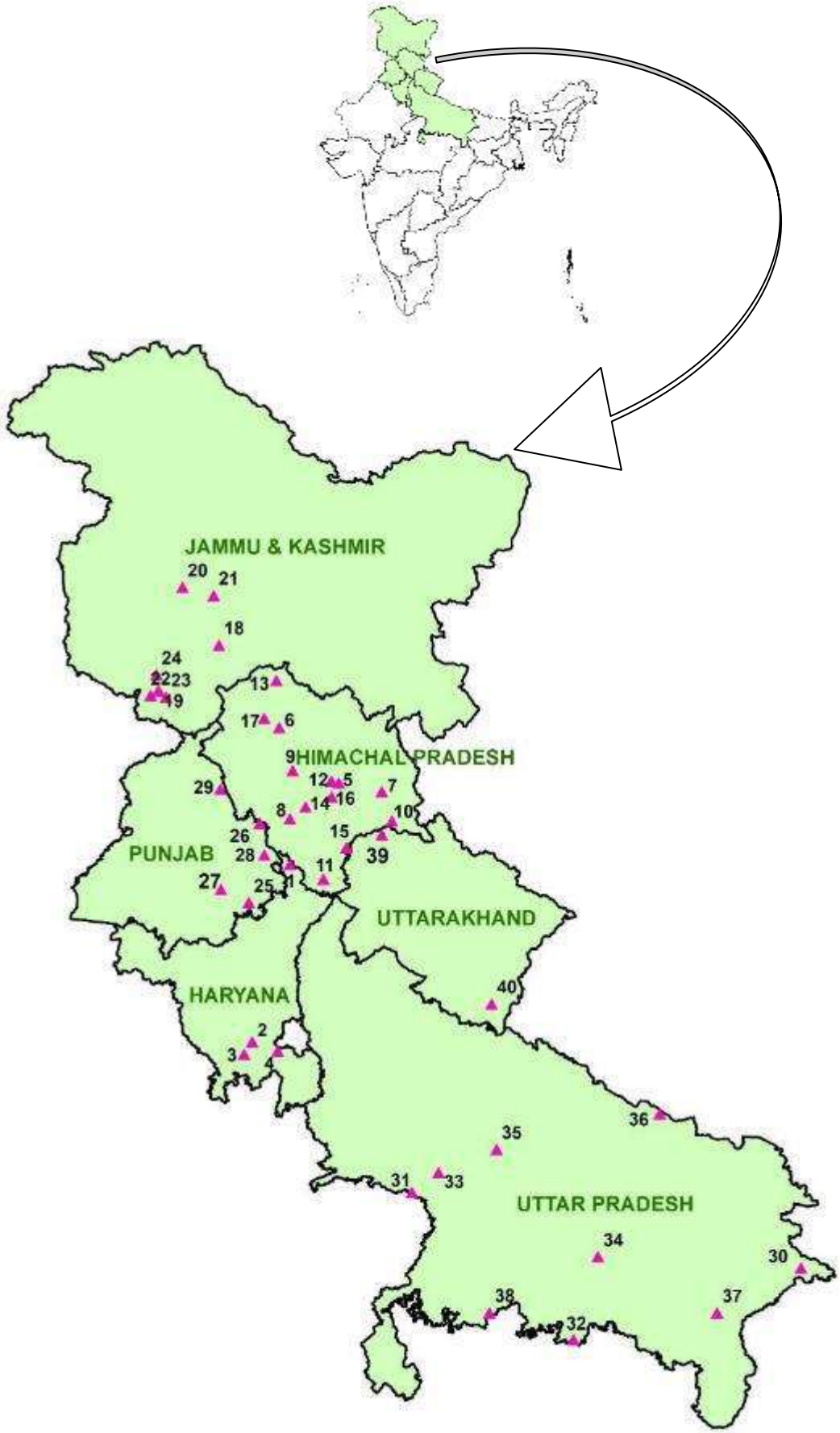
CHAPTER THREE

REGION-WISE MANAGEMENT STRENGTHS, MANAGEMENT WEAKNESSES AND IMMEDIATE ACTIONABLE POINTS

NORTHERN REGION

3.1 NORTHERN REGION

PA ID	Name of NP&WLS	State
1	Bir Shikargarh WLS	Haryana
2	Khaparwas WLS	Haryana
3	Nahar WLS	Haryana
4	Sultanpur NP	Haryana
5	Great Himalayan NP	Himachal Pradesh
6	Kugti WLS	Himachal Pradesh
7	Lippa Asrang WLS	Himachal Pradesh
8	Majathal WLS	Himachal Pradesh
9	Nargu WLS	Himachal Pradesh
10	Rakchham Chitkul (Sangla Valley) WLS	Himachal Pradesh
11	Renuka WLS	Himachal Pradesh
12	Sainj WLS	Himachal Pradesh
13	Sech Tuan Nala WLS	Himachal Pradesh
14	Shikari Devi WLS	Himachal Pradesh
15	Talra WLS	Himachal Pradesh
16	Tirthan WLS	Himachal Pradesh
17	Tundah WLS	Himachal Pradesh
18	Kishtwar NP	Jammu & Kashmir
19	Nandni WLS	Jammu & Kashmir
20	Overa-Aru WLS	Jammu & Kashmir
21	Rajparian (Daksum) WLS	Jammu & Kashmir
22	Ramnagar Rakha WLS	Jammu & Kashmir
23	Surinsar Mansar WLS	Jammu & Kashmir
24	Trikuta WLS	Jammu & Kashmir
25	Bir Motibagh WLS	Punjab
26	Jhajjar Bacholi WLS	Punjab
27	Kathlaur Kushlian WLS	Punjab
28	Nangal WLS	Punjab
29	Takhni-Rehampur WLS	Punjab
30	Jai Prakash Narayan (Surhatal) Bird WLS	Uttar Pradesh
31	National Chambal WLS	Uttar Pradesh
32	Ranipur WLS	Uttar Pradesh
33	Saman Bird WLS	Uttar Pradesh
34	Samaspur Bird WLS	Uttar Pradesh
35	Sandi Birds WLS	Uttar Pradesh
36	Sohelwa WLS	Uttar Pradesh
37	Turtle WLS	Uttar Pradesh
38	Vijai Sagar WLS	Uttar Pradesh
39	Govind NP	Uttarakhand
40	Nandhaur WLS	Uttarakhand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HARYANA

Based on the Management effectiveness evaluation of the 06 Protected Areas in the State of Haryana, the MEE team 1 furnished following suggestions/ recommendations for the better and effective management of protected areas in the state:

1. The committee observed that most of the protected areas excepting Sultanpur National Park in the state have attracted little management attention from the authority.
2. There is need for preparation of updated Management plans for the PAs as per the WII guidelines at an earliest.
3. Committee recommends filling up of all vacant posts immediately and the need to show the required staff in the new management plan with justifications and pursued for early sanctioning of the same.
4. Efforts should be made to involve NGOs and local stakeholders including gram sabhas to contribute in management.
5. Despite of having a globally significant BNHS Vulture Breeding Centre situated adjacent to the PA the present PA manager Divisional Wildlife Officer (DWLO) of Bir-Shikargarh Sanctuary failed to harness any support and benefit of it for which the manager should put effort to harness.
6. Systematic monitoring of threats and monitoring of species populations and habitat parameters need to be undertaken on regular basis by the staff in association with the local Universities/Institutions and NGOs.
7. The committee recommends regular monitoring and assessments of the population of Sambhar reported to be visiting Bir-Shikargah Sanctuary for a brief period in winters. Necessary plantation of preferred food species of Sambar need to be undertaken to ensure that the deer visiting the PA during winters stay for a longer duration.
8. There is need for establishing of state climate change cell by Haryana State Government and initiation of studies on climate change impacts on Sultanpur N.P and other PAs through local Universities and Institutions.
9. The Committee did not find any significant biological or social values of the Khaparwas WL Sanctuary to support its independent PA status as WLS and as such recommends that the area either be declared as conservation reserve. Or merged with Bindawas WLS and manage together as one unit.
10. The efforts need to be made to ensure timely release of funds through the state treasury system as the same have been reported affecting time bound completion of forestry works.

1. Bir Shikargah Wildlife Sanctuary, Haryana
MEE Score- 45% (Fair)

Management Strengths

1. Bir Shikargah Wildlife Sanctuary, being adjacent to the globally significant BNHS Vulture Breeding Centre, in Haryana, attracts significant numbers of visitors, particularly in winter.
2. The sanctuary has a well demarcated ESZ and boundaries.
3. There are no villages inside the PA.
4. The PA attracts a few Sambar in winter.

Management Weaknesses

1. The release of funds through the state treasury system affects time-bound forestry works.
2. The strength of the frontline staff is inadequate to overlook the management of the PA.

3. Although the globally significant BNHS Vulture Breeding Centre is situated adjacent to the PA, the present PA manager, the Divisional Wildlife Officer (DWLO), has failed to harness any support and benefit therefrom.
4. Although there is no village inside the PA, a number of villages are located outside, along the boundary.
5. Almost all the villages have their approach roads passing through the park and brings in some amount of biotic interference.
6. Poor public participation in the planning stage according to the Inspector.
7. No EDCs have been constituted although there are number of villages adjacent to the PA.
8. No action has been initiated by the management to provide livelihood options for the people of the adjacent villages.
9. Although Sambar visit the PA for a short period during winter, as reported by the Inspector, their numbers have not been assessed systematically. No animal census has been conducted.

Immediate Actionable Points

1. The MEE Committee recommends the submission of an updated management plan as per the WII guidelines at the earliest.
2. Filling up of all vacant posts immediately is recommended.
3. The staff members required may be shown in the new management plan with justification. The expeditious sanctioning of the staff positions must be pursued.
4. Provisions should be made to provide promotional avenues for the frontline staff.
5. Efforts should be made to involve NGOs in the management of the PA.
6. Systematic monitoring of threats on a regular basis may be taken up by the staff.
7. The Committee recommends planting food species preferred by Sambar to ensure that the deer visiting the PA in winter stay for a longer duration.
8. The park management should initiate the preparation of a management plan as the present plan expires in 2020–21.
9. The park management should constitute EDCs immediately for the villages situated around the PA.
10. Efforts should be made to assess the numbers of the Sambar visiting the PA in winter (as reported by the Inspector) and to conduct animal census periodically.
11. A website should be developed for the PA to highlight the achievements of the forest department.

Evaluators

Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

2. Khaparwas Wildlife Sanctuary, Haryana

MEE Score- 29.16% (Poor)

Management Strengths

1. The PA, being a part of the Yamuna river basin, is located in a predominantly agrarian part of the state. It is close to Bindawas Wildlife Sanctuary, which supports a rich biodiversity.
2. The site alsohas a richfreshwater faunal biodiversity, and so there are opportunities to conserve aquatic birds.

Management Weaknesses

1. The release of funds through the state treasury system affects time-bound forestry works.
2. There is no separate management plan. Management prescriptions have been included in the management plan of Bindawas Wildlife Sanctuary.
3. The embankment and a part of the PA are being used by villagers as approach roads/paths to reach their villages. The plantation area of the PA is used excessively by villagers for livestock grazing.
4. There appears to be no control of the biological pressure of cattle.
5. The management plan has not been updated.
6. There are no facilities for visitors.
7. No systematic inventory report is available.
8. The strength of the staff is grossly inadequate. The officer in charge of the PA is the one who is responsible for Bindawas Wildlife Sanctuary.

Immediate Actionable Points

1. The MEE Committee did not find any significant biological or social values of the PA to support its status as an independent PA. The Committee recommends that the area either be declared a conservation reserve or be merged with Bindawas Wildlife Sanctuary and be managed together with it as one unit.
2. Efforts are needed to ensure that there is a corridor connection between Bindawas and Khapharwas WLS so that they are conserved and effectively managed in the long term.
3. If the PA is to be managed independently, a specific management plan must be prepared for the PA according to the WII guidelines at the earliest.
4. Efforts should be made to fence the area if at all the PA status is maintained so the use of embankment by villagers is diverted to reduce the biotic pressure.
5. The statutory requirements of appointing Honorary Wardens and forming a PA advisory committee should be met with, if the PA is managed independent of Bindawas WLS.
6. Local participation in planning and implementation of works must be enhanced and transparency ensured.
7. More field staff members need to be posted if Khapharwas is to continue as an independent PA.

Evaluators

Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

3. Nahar Wildlife Sanctuary, Haryana

MEE Score- 41.67% (Fair)

Management Strengths

1. Nahar Wildlife Sanctuary has well demarcated boundaries and has been categorized systematically into core and buffer zones for management purposes.
2. There is minimal biotic interference as there are no villages inside the PA.
3. There is a significant, growing population of blackbuck in the PA.
4. There is significant involvement of the people of the surrounding villages in the management of the park.

Management Weaknesses

1. Untimely release of funds through the state treasury system affects time-bound forestry works.
2. The park is infested with weeds such as *Prosopis juliflora*.
3. The strength of the frontline staff is inadequate.

Immediate Actionable Points

1. Since the management plan of the sanctuary expired in 2014–15, preparation of the new management plan as per the WII format needs to be expedited. The new management plan needs to be approved by the appropriate authority.
2. The *Prosopis* needs to be removed manually as well as mechanically through EDCs. This removal must be included in the new management plan.
3. Efforts should be made to get an adequate number of posts sanctioned, engaged and deployed for effective management of the PA.
4. The infrastructure also needs to be enhanced according to the envisaged manpower.
5. The available funds need to be enhanced with the envisaged enhancement of manpower. The funds must be released in a timely manner.
6. There is scope for research on habitat restoration. It is recommended that such research be initiated in collaboration with universities and institutes.

Evaluators

Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

4. Sultanpur National Park, Haryana

MEE Score- 64.17% (Good)

Management Strengths

1. Sultanpur Bird Sanctuary, being one of the important tourist destinations of Haryana, attracts significant numbers of tourists, particularly in winter, for waterfowl viewing.
2. The sanctuary has well demarcated boundaries, and it has been systematically categorized into core and buffer zones for management purposes.
3. There is minimal biotic interference as there are no villages inside the PA.
4. The habitat restoration programmes have been envisaged in a planned manner and are monitored systematically.
5. The road network used for patrolling has been considerably improved.
6. The performance of most of the staff members is visible in the achievement of relevant management objectives.
7. The populations of most of the endangered and threatened species are reported to be increasing/ stable.
8. The park has a good participatory network of stakeholders, who are utilized in management processes and as guides and guards.
9. Since the park is undergoing the second cycle of evaluation, the management processes have been improved considerably with respect to the first cycle of evaluation, made in 2006–07.

Management Weaknesses

1. The release of funds through the state treasury system affects time-bound forestry works adversely.

2. The staff strength of the park is inadequate, with minimal promotional avenues.
3. Systematic monitoring of threats has not been emphasized much.

Immediate Actionable Points

1. It is recommended that an updated management plan be submitted in accordance with the WII guidelines at the earliest.
2. Minutes of the coordination meetings, functions and visits of the police and judiciary need to be maintained by the management of the park.
3. A new chapter on landscape management of satellite wetlands needs to be added in the new management plan.
4. It is recommended that all vacant posts be filled immediately.
5. The requirement of staffs should be listed in the new management plan with justifications. Early sanctioning of the posts should be pursued.
6. Provision of promotional avenues for members of the frontline staff may be made.
7. Systematic monitoring of threats, including habitat parameters such as weeds, may be undertaken on a regular basis.
8. Outsourced staff members should be trained by the park staff.
9. A report of various studies conducted in the PA by BSI, ZSI and BNHS may be compiled for use in management planning.
10. Studies on the impacts of climate change on Sultanpur National Park need to be initiated through local universities and institutions.
11. NGOs contributions needs to be streamlined.

Evaluators

Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

HIMACHAL PRADESH

Based on the Management effectiveness evaluation of the 13 Protected Areas in the State of Himachal Pradesh, the MEE team of Northern Region furnished following suggestions/ recommendations for the better and effective management of protected areas in the state.

1. Although Himachal Pradesh Forest Department has made commendable work and PA management and ensured well designed corridor connectivity and landscape planning between PAs particularly GHNP, Sainj and Tirthan WLS, there is need for initiation of updated Management Plans as per WII guidelines forthwith which should include ESZ proposal and pursuance for early finalization of the same.
2. There is need for exploring more areas in buffer areas and in other PAs ie Kugati WLS, etc for promotion of trekking and ecotourism activities in order to reduce excessive pressure on the existing ecotourism zone in Tirthan WLS.
3. Coordination between the BTCA and other SHGs and NGOs of Tirthan and Sainj to ensure that some of the trekkers are motivated for trekking through the potential routes in Sainj WLS.
4. The project staff engaged in the NMHS-NLC project needs to be involved in inventorization and population monitoring and building Systematic baseline data on flora and fauna in the PAs.
5. The animal population monitoring and census exercises in consultation with the local institutions and WII need to be made a regular feature for ensuring effective science based

management interventions for the long term conservation and survival of species and their habitats.

6. Systematic monitoring of threats such as fire, illicit felling, and lopping, felling, encroachment should be carried out on regular basis.
7. Monitoring of Pre and Post scenario on reduction of anthropogenic pressures on PA with regard to schemes such as distribution of Induction heater / LPG, Seed, Pressure Cooker to local communities need to be done.
8. Range office headquarter of Nargu WLS which presently seem to be very remotely located need to be established at centrally located place to ensure effective monitoring of the substantial area of the PA.
9. Need for better coordination with line departments including with territorial divisions and local communities during planning stage for better implementation of the schemes and management plan in the PAs.
10. Although a system of awards for the staffs exist at the state level, to encourage the frontline forces, appreciation to staffs by rewading some incentives to them at PA level should also be initiated.
11. A detailed plan should be drwan up by to adopt climate change reselient management in coordination with the Himanchal Pradesh Center on Climate Change, HPCCC.
12. The manager of PAs must conduct self MEE exercise and the records should be maintained for reference for future monitoring.
13. Since no estimation details of the population of important wildlife has been done so far for these PAs, it is very essential that rapid surveys/population estimation at least of the key species of these PAs following robust scientific methods is conducted now and on subsequent periods to know the population trends. This information will be of immense for the Management Plan of these PAs for which Management Planning is under preparation now and for other areas during the revision of Plans.
14. All the PAS are in high altitude ranges which are under snow cover for about six months during the winter season and remain snow clad for many months (except Majathal Wildlife Sanctuary where snow fall does not last for a longer period). Accordingly, the period of execution of many management activities is limited and calls for early release of funds to all these PAs.
15. The Management Plan for all these PAs (except for Majathal, Seichu Tuan Nala and Shikari Devi Wildlife Sanctuaries) need to be finalized and approved by the Competent Authority at the earliest. It was informed that the Plans for other areas are under preparation. The Team also saw the draft Plan for Talra and Rakchham ChhitkulWildlife Sanctuary.
16. Being high-altitude PAS, which are under snow cover for more than six months during winters. The period of work available is very short. The government may consider to relax some of the procedural protocols like calling for tenders which consumes much time as a special case for such remote and snow bound areas.
17. In 2013, the Government of Himachal Pradesh has undertaken massive rationalization of PA boundary by excluding number of villages from the Sanctuary and now these villages fall in territorial forest division. This novel move on one hand will facilitate the aspiration for basic developmental works of the local people, it may also be required that the Forest department initiates programs to identify the levels of resource dependency on forests around the villages and special initiatives towards augmenting livelihood options, alternative energy sources and methods and encouraging tree growing activities in common community lands are undertaken.
18. Cattle grazing (specially sheep and goats) by the nomadic as well as the local herder's pose threat all these PAs. The assessment of the number of cattle by the herders and the population trend of cattle is lacking in the Management Plan. It is suggested that workable management interventions e.g. rotational grazing, closure of unique habitats,

creation of better awareness among the herders, examining alternative options for livelihood enhancement to the community which may encourage them to reduce numbers of cattle over a period of time may be attempted.

19. Many PAs in the State have undergone the process of reorganization through rationalization of their boundaries. Consequently, there has been large enhancement or reduction of their extent when compared to the original notifications. It is therefore, suggested that the data base of PA Network maintained by WII may be accordingly revised in coordination with the State Government and MoEFCC.

5. Great Himalayan National Park, Himachal Pradesh

MEE Score- 84.17% (Very Good)

Management Strengths

1. The proximity of the Great Himalayan National Park (GHNP) to a city, an important tourist destination, namely Kullu-Manali, and the corridor connectivity it has with Pin Valley National Park.
2. There is well designed and established corridor, networking and landscape planning between GHNP, Sainj and Tirthan WLS.
3. Barring one family settlement, the PA is free of encroachments and settlements.
4. Adequate funding for GHNP is being received on time from state and central schemes (the CSS, CAMPA and CAPEX budgets).
5. The number of human–wildlife conflict cases recorded in and around the park is insignificant.
6. The staff strength is satisfactory.
7. Mobile allowances are provided to officers and the frontline staff. FThey can use their personal mobiles for wildlife management and protection purposes.
8. The livelihood issues of the resource-dependent communities are being addressed effectively through various registered societies.
9. There are well planned and monitored habitat restoration programmes.
10. The site has a comprehensive science-based management plan with the threats being identified, assessed and monitored systematically.

Management Weaknesses

1. In accessibility of musch of the national park is a great impediment to carrying out equitable management interventions in the area.
2. The site has immense biotic pressures including livestock grazing and NTFP collection, which was also reflected in first MEE assessment in 2006–07.
3. There is no systematic monitoring of wildlife in the PA.

Immediate Actionable Points

1. There is a need to explore more areas in the buffer zone to promote trekking and ecotourism activities through the BTCA and other self-help groups (SHG) to reduce excessive pressure on the existing ecotourism zone in the core zone of the park.
2. The project staff engaged in the NMHS-NLC project need to be involved in making inventories of the flora and fauna of the sanctuary and in monitoring populations and building systematic baseline data.
3. The animal population monitoring and census exercises being carried out in consultation with local institutions and WII need to be strengthened and carried out regularly to ensure that effective science-based management interventions for the long-term conservation and survival of species and their habitats.

4. There is scope for further involvement of the communities in the management activities and eco-development and ecotourism programmes in the GHNP landscape to enable marginal fringe communities around the landscape previously reliant upon NTFP and livestock resources to benefit from the economic and social aspects of this new source of sustainable income-generating ecotourism while reducing impacts on the environment and wildlife.

Evaluators

Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

6. Kugti Wildlife Sanctuary, Himachal Pradesh
MEE Score- 73.33% (Good)

Management Strengths

1. Kugti WLS is connected to Tundah WLS and Dauladhar WLS, in Hamirpur Wildlife Division, and to Nargu WLS, in Kullu Wildlife Division, thereby forming a large wilderness landscape.
2. There is no pressure of poaching.
3. Kugti is the one of the best areas for the Himalayan brown bear, Asiatic black bear, snow leopard and musk deer.
4. The area has great potential for eco-tourism and pilgrimage with the Mani-Mahesh and Kartik temples located in it.

Management Weaknesses

1. Most of the PA is inaccessible, which hampers the routine monitoring and surveillance in the PA.
2. The management plan of the sanctuary has not been updated.
3. No communication system is available once the staff members go to remote areas for work.
4. No eco-development committees have been constituted.

Immediate Actionable Points

1. The work on the new wildlife management plan should be expedited forthwith as per WII guidelines and should include an ESZ proposal. The plan should be finalized as early as possible.
2. Better coordination with line departments and local communities is needed for the schemes and management plan to be implemented better.
3. Systematic monitoring of threats such as fires, illicit felling, lopping, felling and encroachment should be carried out on a regular basis.
4. Systematic monitoring of the status and distribution of most threatened species needs to be strengthened further to ensure that the management planning for the species and habitats is scientific.
5. Signage is needed at different places and offices. A map showing the management units of the division up to the level of beat office should be displayed.
6. Meetings should be held with stakeholders from the beginning of the management and planning stages.
7. Re-organization of the staff is required.
8. The park has to develop guidelines for eco-tourism.

9. The management should constitute eco-development committees at the earliest to strengthen the park–people interface.
10. The management should participate in meetings with other line departments and highlight the problems and requirements of people living on the periphery of the park.
11. The park should have an efficient communication system for the frontline staff and for patrolling, such as a wireless system with walkie-talkies.

Evaluators

Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

7. Lippa-Asrang Wildlife Sanctuary, Himachal Pradesh
MEE Score- 53.33% (Fair)
Management Strengths

1. There are no encroachments and villages inside this PA.
2. The PA is part of a larger forested landscape in which there is scope for corridors or networks. There is a good possibility of developing a landscape-level plan.
3. During the last 3 years, this PA has had no records of human–wildlife conflict.
4. During the last 3 years, the PA has received adequate funds from CSS and CAMPA.
5. The staff is sufficient (all the posts are filled), and the staff are involved in protection and management.
6. Mobile allowances are provided to all the officers and the frontline staff members. They can use personal mobiles for protection and management purposes.
7. The local people support the protection and management of the PA fully.

Management Weaknesses

1. The management plan has expired (1995–96 to 2004–05), and a new management plan is just being written.
2. There is no zonation (core, buffer or tourism and eco-sensitive zones (ESZ).
3. No contributions are received from NGOs in cash or kind for the management of the PA.
4. There is no staff member or range-level officer formally trained in wildlife management.

Immediate Actionable Points

1. The wildlife management plan should be redrafted in accordance with the WII guidelines, with proper zonation, including the ESZ, and its implementation should be expedited.
2. The PA manager needs to coordinate with officers of the respective territorial divisions to which the adjoining forests belong so as to integrate landscape-level planning into their respective working plans.
3. A post of ACF needs to be created and an officer appointed immediately.
4. The existing communication equipment such as wireless sets should be repaired or replaced with new sets and used for effective patrolling, and the coordination with the other enforcement or line agencies must be enhanced.
5. Better coordination with the line departments is needed to tap state and district resources.
6. Systematic risk and protection plans are to be included in the wildlife management plan.

7. The officers from the DFO downwards and all the frontline staff should be trained in wildlife management.
8. The manager of the PA must ensure that there is effective public participation in the planning and management of the PA.
9. The situ before and after the reduction of anthropogenic pressures on the PA with regard to schemes such as distribution of LPG connections should be monitored to assess the impact of the schemes.
10. A district-level website must be developed for the PA, and the site must be linked with the website of the state forest department.
11. Systematic baseline data on the flora and fauna, specifically the rare, endemic and threatened (RET) species and the IUCN Red List and IWPA Schedule species, should be generated as quickly as possible and the flora and fauna systematically monitored.
12. Eco-development committees (EDCs) should be constituted to mobilize support for the conservation plans and programmes of the PA.

Evaluators
Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

8. Majathal Wildlife Sanctuary, Himachal Pradesh
MEE Score- 58.33% (Fair)

Management Strengths

1. The sanctuary is well buffered on the western side.
2. The sanctuary has an approved management plan for the period from 2018–19 to 2028–29.
3. The biodiversity of the sanctuary is rich, and the sanctuary is supposed to have high densities of the Cheer Pheasant and Goral.
4. The sanctuary has an eco-sensitive zone of extent 12.68 km^2. This was approved by MoEFCC on 7 June 2017.

Management Weaknesses

1. No exercise has been carried out to monitor important wildlife populations in the sanctuary so far.
2. The river Sutlej runs along the boundary of the sanctuary. Patrolling by boats is being undertaken. These efforts may be stepped up.

Immediate Action Points

1. Since no estimation of the populations of important wildlife species has been carried out so far, scientific surveys or estimates based on robust methods need to be conducted or made for key species found in the sanctuary.
2. The livelihood issues need to be assessed and suitable interventions required during the remaining period of the management plan.

Evaluators
Dr. V.K. Melkani, Former CWLW, Government of Tamil Nadu
Dr. Vibhu Prakash, Scientist, Vulture Breeding Centre, BNHS
Dr. Jeet Ram, Professor, Kumaun University, Nainital
Dr. K. Sivakumar, Scientist-F, WII

9. Nargu Wildlife Sanctuary, Himachal Pradesh
MEE Score- 70% (Good)

Management Strengths

1. The ecotourism potential of the PA is good. It has a number of potential sites, viz., Nargu Top, Bhu-bhu Pass, Chuhar Valley, Uhal River, etc.
2. There have been no cases of human–wildlife conflict in the PA during the last 3 years.
3. The threats faced by the sanctuary are negligible after rationalization of the PA.
4. The available funds (CAMPA (Koldam and CAT Plan) and CSS) are adequate for the management of the PA. The funds received in BioDCS are ploughed back to the management of the PA.
5. Mobile allowances are provided to all the officers and frontline staff. They can use personal mobiles for protection and management purposes.

Management Weaknesses

1. Inaccessibility of most PA area hampers the routine monitoring and surveillance in the PA.
2. No systematic inventory of the flora and fauna of the PA has been made. Wildlife is not monitored systematically in the PA.
3. The headquarters of the range office seem to be very remotely located.

Immediate Actionable Points

1. Systematic monitoring of threats such as fires, illicit felling, lopping, felling and encroachment should be carried out. The wildlife must be monitored on a regular basis.
2. Anthropogenic pressures in the PA must be monitored before and after schemes such as distribution of induction heaters and LPG connections, seeds and pressure cookers to local communities need to be done.
3. Work on the new wildlife management plan should be initiated forthwith as per WII guidelines and should include an ESZ proposal. The plan should be finalized quickly.
4. The range office (headquarters), which presently seems to be very remotely located, needs to be established at a centrally located place to ensure that a substantial part of the PA is effectively monitored.
5. Better coordination with line departments and local communities is needed for the implementation of the schemes and management plan to be improved.

Evaluators
Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

10. Rakchham Chhitkul (Sangla Valley) Wildlife Sanctuary, Himachal Pradesh
MEE Score- 56.67% (Fair)

Management Strengths

1. The sanctuary is free of very high levels of anthropogenic pressure. There is no village within the sanctuary.
2. The terrain is mountainous, and most areas are inaccessible.
3. The presence of ITBP Check-post and personnel near Chhitkul, the last village, provides support to the management as no one who is not a staff member of the the Forest Department is allowed entry into the interior of the sanctuary for security reasons. This is helpful for the protection of the sanctuary.

4. The villages Sangla, Rakchham and Chhitkul are connected by road, and many tourists visit the area; however, the number of visitors to the sanctuary area is not high or threatening.
5. The sanctuary has biological, ecological, hydrological and recreational values.

Management Weaknesses

1. Being located in a high-altitude area, the sanctuary remains snow covered for almost 6 months in a year. Thus the period in which management-related activities can be carried out is short. This calls for timely availability of funds for undertaking management-related works.
2. Patrolling gear and vehicles required for undertaking winter patrolling are lacking.
3. There is no approved management plan for the sanctuary in place to guide and prioritise various management inputs for effective delivery of outputs in tune with the management objectives of the sanctuary. The plan prepared for the period from 2011–12 to 2021–22 is yet to be approved. The draft plan also needs many corrections and suitable revisions.
4. The current strength of the staff and the facilities available are not sufficient for the tough terrain of the sanctuary.
5. No robust scientific exercise has been attempted to monitor important wildlife populations in the sanctuary.

Immediate Action Points

1. The draft management plan for the sanctuary for the period from 2011–12 to 2021–22) may be modified/corrected and approval obtained from the competent authority at the earliest.
2. Since no estimates have been made of the populations of important wildlife species so far, rapid surveys or estimates based on robust methods should be conducted or made now. The information gathered should be incorporated in the management plan of the sanctuary, which is being revised now.
3. The state government may consider providing more personnel for the field staff as well as more field gear and vehicles for winter patrolling. The capacity of the staff to carry out patrols in winter needs to be developed.
4. The sanctuary is situated in a high-altitude area that remains snow covered for about 6 months in a year, and the period in which management-related works can be carried out is short. The government may consider relaxing the procedures involved in calling for tenders for works. These procedures are time consuming, whereas the period of time available for undertaking management activities is limited. Timely funding support is also required.

Evaluators

Dr. V.K. Melkani, Former CWLW, Government of Tamil Nadu
Dr. Vibhu Prakash, Scientist, Vulture Breeding Centre, BNHS
Dr. Jeet Ram, Professor, Kumaun University, Nainital
Dr. K. Sivakumar, Scientist-F, WII

11. Renuka Ji Wildlife Sanctuary, Himachal Pradesh

MEE Score- 55.83% (Fair)

Management Strengths

1. There are no encroachments or villages inside this PA.
2. During the last 3 years, this PA has had no records of human–wildlife conflict.
3. During the last 3 years, the PA has received adequate funds from CSS and CAMPA (KOL Dam).

4. The strength of the staff is sufficient (all the posts have been filled), and the staff are involved in protection and management.
5. Mobile allowances are provided to all the officers and the frontline staff members. They can use personal mobiles for protection and management purposes.
6. The local people support the protection and management of the PA fully.
7. The proposal for an eco-sensitive zone has been submitted to the Government of India (yet to be approved at GOI level).

Management Weaknesses

1. The management plan has expired (2002–03 to 2012–13), and the new management plan, for 2018–19 to 2028–29, is under preparation.
2. There is no possibility of any landscape connectivity as the territorial forests are fragmented, with agricultural lands spread out intermittently.
3. There is no zonation (core and buffer zones).
4. No contributions are received from NGOs, including the Renukaji Development Board, in the form of cash or kind for the management of the PA.
5. There is no staff or range-level officer who has been formally trained in wildlife management.
6. No appreciation or incentives are received by the field staff although a system of awards for the staff exists at the state level.
7. No support has been received so far from the Renukaji Development Board for any aspect of management.

Immediate Actionable Points

1. The wildlife management Plan should be redrafted in accordance with the WII guidelines, and the ESZ proposal should be included in it. This should be expedited.
2. The manager of the PA needs to coordinate with officers of the respective territorial division to which the adjoining forests belong so as to integrate landscape-level planning into their respective working plans.
3. Better coordination with the line departments is needed to tap state and district resources.
4. Systematic risk and protection plans are to be included in the wildlife management plan.
5. The Range Officer and all members of the frontline staff should be trained in wildlife management.
6. The management should pursue the final declaration of the ESZ with the MoEFCC.
7. The manager of the PA must ensure that there is effective public participation in the planning and management activities of the PA.
8. The situations before and after the reduction of anthropogenic pressures on the PA with regard to schemes such as distribution of sewing machines should be monitored to assess the impact of the schemes.
9. The development of a divisional level website for the PA must be expedited, and the site must be linked with the website of the state forest department.
10. Systematic baseline data on the flora and fauna, specifically the rare, endemic and threatened (RET) species and the IUCN Red List and IWPA Schedule species, should be generated as quickly as possible and the flora and fauna systematically monitored.
11. Eco-development committees (EDCs) should be constituted to mobilize the support of the local people for the conservation plans and programmes of the PA.
12. A detailed plan should be drawn up to adopt climate change-resilient management in coordination with the Himachal Pradesh Centre On Climate Change, HPCCC.

13. The manager of the PA must conduct self-MEE exercises, and the records should be maintained for reference in the future for monitoring.
14. Establishment and upgrading of signage is needed (warning, education, information).
15. The matter relating to pollution and siltation needs to be undertaken with the temple authority.
16. The management authority must get support from the Renukaji Development Board in terms of improvement of signage, maintenance of the road and checking pollution and desilting of the wetland.
17. The management of the PA, with the help of the Renukaji Development Board, should regulate the movements of pilgrims inside the PA in order to prevent any eventuality, and those who intend to visit the zoo premises should be levied a nominal fee that could be ploughed back for maintenance of the zoo.
18. Since the zoo is established within the PA, all prevailing rules and regulations of CZA must be followed.
19. As there is a plan to develop a hydro-electric project that involves the construction of a Renuka dam, the management of the PA should ensure that all clearances, viz., wildlife clearance, forest clearance and environment clearance, are obtained.

Evaluators
Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

12. Sainj Wildlife Sanctuary, Himachal Pradesh

MEE Score- 82.50% (Very Good)

Management Strengths

1. The proximity of Sainj to a city and important tourist destination, Kullu-Manali, and the connectivity with Pin Valley National Park.
2. There is well designed and established corridor, networking and landscape planning between GHNP and Tirthan WLS.
3. Barring one family settlement, the PA is free from encroachments and settlements.
4. Adequate funding is being received on time from state and central schemes (the CSS, CAMPA and CAPEX budgets).
5. The number of human–wildlife conflict cases recorded in and around the national park is insignificant.
6. The staff strength is satisfactory.
7. Mobile allowances are provided to the officers and frontline staff. They can use personal mobiles for wildlife management and protection purposes.
8. The livelihood issues of resource-dependent communities are being addressed effectively through various registered societies.
9. Habitat restoration programmes are planned and monitored well.
10. The site has a comprehensive science-based management plan. Threats are identified, assessed and monitored systematically.

Management Weaknesses

1. Inaccessibility of much of the sanctuary area is a great impediment to ensuring that management interventions in the area are equitable.
2. The site has immense biotic pressures, including livestock grazing and NTFP collection, which were also reported in the first MEE assessment in 2006–07.

3. There is no systematic monitoring of wildlife in the PA.

Immediate Actionable Points

1. More areas in the buffer zone need to be explored to promote trekking and eco-tourism activities through the BTCA and other self-help groups (SHGs) in order to reduce excessive pressure on the existing ecotourism zone in the core zone of the park.
2. The project staff engaged in the NMHS-NLC project need to be involved in making an inventory of the flora and fauna of the sanctuary, monitoring populations and building systematic baseline data.
3. The animal population monitoring and census exercises being held in consultation with local institutions and WII need to be strengthened and conducted regularly to ensure that management interventions for long-term conservation and survival of species and their habitats are based on science.
4. There is scope for further community involvement in the management activities and eco-development and ecotourism programmes in the GHNP landscape to enable marginal fringe communities around the landscape previously reliant upon NTFP and livestock resources to benefit from the economic and social aspects of this new source of sustainable income generation, ecotourism, while reducing the impacts on the environment and wildlife.
5. Facilities need to be provided to sell local products to the Mahela Samiti of the village near Sainj WLS.

Evaluators
Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

13. Seichu Tuan Nalla Wildlife Sanctuary, Himachal Pradesh

MEE Score- 60% (Good)

Management Strengths

1. The sanctuary has an approved management plan for the period from 2010 -11 to 2020 -21.shi
2. The level of anthropogenic pressure in the sanctuary is not very high. One village, Murch, is situated within the sanctuary. The area is inaccessible and, therefore, by and large not disturbed.
3. The terrain is mountainous, and the area is mostly inaccessible. The sanctuary harbours rare and endangered high-altitude plants and animals. Most of the area remains permanently covered in snow.
4. The sanctuary has biological, ecological, hydrological, cultural and natural values and is well buffered by the surrounding territorial forests.

Management Weaknesses

1. As the sanctuary is situated in a high-altitude area, most of the area is permanently covered in snow. The other areas are also covered in snow for almost 6 months in a year. The working conditions are harsh, and so the time available for working on management-related activities is short. This calls for timely availability of funds for undertaking management-related works.
2. Patrolling gear and vehicles needed for undertaking winter patrols are not available.
3. Local herders graze their livestock in the alpine areas though banned.

4. Insufficient current staff strength and available facilities for the tough terrain of the sanctuary, such as motorable roads and telephone connectivity.
5. A robust scientific exercise has not been carried out systematically to monitor important wildlife populations in the sanctuary.
6. Lack of awareness among the local community.

Immediate Action Points

1. Rapid surveys or estimates based on robust methods need to be conducted or made for use in the management plan that need revision before 2020-21.
2. The state government may consider increasing the strength of the field staff and providing more field gear and vehicles for winter patrolling. Development of the capacity of the staff to carry out patrols in winter may also be considered.
3. The sanctuary is located in a high-altitude area that remains covered in snow for about 6 months in a year, and the period in which management-related works may be undertaken is short and calls for relaxing procedural protocols. This requirement is time consuming. Funding support needs to be provided in a timely manner to undertake management activities in the short period of time available.

Evaluators

Dr. V.K. Melkani, Former CWLW, Government of Tamil Nadu
Dr. Vibhu Prakash, Scientist, Vulture Breeding Centre, BNHS
Dr. Jeet Ram, Professor, Kumaun University, Nainital
Dr. K. Sivakumar, Scientist-F, WII

14. Shikari Devi Wildlife Sanctuary, Himachal Pradesh
MEE Score- 62.93% (Good)

Management Strengths

1. The sanctuary has several important values: ecological, biological, geomorphic, hydrological, cultural, religious, recreational, research and educational.
2. The terrain is by and large mountainous, and many areas are inaccessible.
3. The management has initiated the collection of entry fees from vehicles going to the Shikari Devi temple, and the proceeds are ploughed back into the account of the Biodiversity Conservation Society, Shamshi, Kullu. The revenues will be utilised for sanctuary management activities.

Management Weaknesses

1. Because the sanctuary is located in a high-altitude area, it remains covered in snow for almost 6 months in a year. As a result, the period available for working on management-related activities is short. Timely availability of funds is required for undertaking management-related works.
2. Patrolling gear and the vehicles required for undertaking patrols in winter are lacking.
3. The current staff strength and facilities are not sufficient for the tough terrain of the sanctuary.
4. No robust scientific exercise has been attempted systematically to monitor important wildlife populations in the sanctuary.
5. After the rationalisation of the boundary, there are now 113 villages on the fringes of the sanctuary. The pressures on the sanctuary resources need to be worked out, and more eco-development activities that provide alternatives to fuelwood, etc. may be attempted.

Immediate Action Points

1. The current management plan of the sanctuary will expire in 2021. After the rationalisation of the boundary, there are 113 villages on the fringes of the sanctuary. Steps need to be taken to revise the plan according to the current extent of 29.94 km^2.
2. Rapid surveys or estimates based on robust methods must be conducted or made. The information obtained can be used in the development of the management plan of the sanctuary after the expiry of the current plan.
3. The state government may consider increasing the strength of the field staff and providing more field gear and vehicles for winter patrolling. The capacity of the staff to carry out patrols may be developed.
4. The sanctuary is located in a high-altitude area that remains covered in snow for about 6 months in a year, and so the period available for undertaking management-related works is short. The government may consider relaxing the procedural protocols associated with works in such areas. The condition of calling for tenders for works, which is time consuming, may be exempted. Funding support may also be provided in a timely manner to undertake management activities in the short period of time available.

Evaluators

Dr. V.K. Melkani, Former CWLW, Government of Tamil Nadu
Dr. Vibhu Prakash, Scientist, Vulture Breeding Centre, BNHS
Dr. Jeet Ram, Professor, Kumaun University, Nainital
Dr. K. Sivakumar, Scientist-F, WII

15. Talra Wildlife Sanctuary, Himachal Pradesh
MEE Score- 55.17% (Fair)

Management Strengths

1. The sanctuary is buffered well on all sides by territorial forests. There are no vehicular paths in the sanctuary.
2. There is no habitation inside the sanctuary. The closest habitations are located 3-15 km from the boundary of the sanctuary.
3. The sanctuary has a draft management plan for the period from 2019–20 to 2029–30, awaiting approval.
1. The sanctuary biological, ecological, hydrological, recreational and research & education values.
2. The sanctuary has approved (by MoEFCC in September 2017) Eco Sensitive Zone (22.56 km^2).

Management Weaknesses

1. No exercise has been carried out so far to monitor important wildlife populations in the sanctuary and to understand population trends of key species.
2. In spite of bereft of habitations, the grazing pressures of nomadic herders of sheep and goats in summer is a source of disturbance to the resources of the sanctuary.
3. The staff do not have field equipments for imparting effective protection.

Immediate Action Points

1. The draft management plan (2019–20 to 2029–30) needs detailed inputs on the management strategies to be adopted to achieve the management objectives. The draft may be submitted to the competent authority soon for approval.
2. Scientific surveys or estimates based on robust methods may be conducted or made for key species found in the sanctuary.

3. The government may consider providing more field equipment and camping gear and facilities to the protection staff especially for those stationed at tough terrain of the sanctuary.

Evaluators
Dr. V.K. Melkani, Former CWLW, Government of Tamil Nadu
Dr. Vibhu Prakash, Scientist, Vulture Breeding Centre, BNHS
Dr. Jeet Ram, Professor, Kumaun University, Nainital
Dr. K. Sivakumar, Scientist-F, WII

16. Tirthan Wildlife Sanctuary, Himachal Pradesh
MEE Score- 84.17% (Very Good)

Management Strengths

1. The proximity to a city and important tourist destination, Kullu-Manali, and the connectivity with Pin Valley National Park.
2. There is well designed and established corridor, networking and landscape planning between GHNP, and Sainj WLS.
3. Adequate funding for is being received on time from state and central schemes (the CSS, CAMPA and CAPEX budgets).
4. The number of human–wildlife conflict cases recorded in and around the park is insignificant.
5. The staff strength is satisfactory.
6. Mobile allowances are provided to officers and the frontline staff. They can use personal mobiles for wildlife management and protection purposes.
7. The livelihood issues of resource-dependent communities are being addressed effectively through various registered societies.
8. Habitat restoration programmes are planned and monitored well.
9. The site has a comprehensive science-based management plan. Threats are identified, assessed and monitored systematically.

Management Weaknesses

1. Inaccessible of much of the sanctuary area is a great impediment to ensuring that the management interventions in the area are equitable.
2. The site has immense biotic pressures including livestock grazing and NTFP collection, which are continuing from the first MEE assessment, which was carried out in 2006–07.
3. There is no systematic monitoring of wildlife in the PA.

Immediate Actionable Points

1. More areas in the buffer zone need to be explored to promote trekking and ecotourism activities through the BTCA and other self-help groups (SHG) in order to reduce excessive pressure on the existing ecotourism zone in the core zone of the park.
2. The project staff engaged in the NMHS-NLC project need to be involved in making an inventory of the fauna and flora of the sanctuary, population monitoring and building systematic baseline data.
3. The animal population monitoring and census exercises conducted in consultation with local institutions and WII need to be strengthened and carried out regularly to ensure that management interventions made for long-term conservation and survival of species and their habitats are effective and based on science.

4. There is scope for further community involvement in the management activities and eco-development and ecotourism programmes in this landscape to enable marginal fringe communities around the landscape previously reliant upon NTFP and livestock resources to benefit from the economic and social aspects of this new source of sustainable income generation, ecotourism, while reducing the impacts on the environment and wildlife.

Evaluators
Shri B.S. Bonal, Former ADG (PT) & MS, NTCA
Dr. Khurshid Ahmad, Professor, Sher-e-Kashmir (SKUAST), Jammu & Kashmir
Dr. Justus Joshua, Green Peace Foundation, Gujarat
Dr. S. Sathyakumar, Scientist-G, WII

17. Tundah Wildlife Sanctuary, Himachal Pradesh

MEE Score- 60% (Good)

Management Strengths

1. The level of anthropogenic pressure in the sanctuary is not very high due to absence of villages inside and inaccessibility of the area.
2. The sanctuary harbours high-altitude plants and animals.
3. The sanctuary has biological, ecological, hydrological, cultural and natural values, and it is well buffered by the surrounding territorial forests.

Management Weaknesses

1. The sanctuary, being situated in a high-altitude area, remains covered in snow for almost 6 months in a year. The working conditions are harsh, and the period in which work can be carried out on management-related activities is short. Timely availability of funds for undertaking management-related works is called for.
2. There is no patrolling gear nor vehicles for undertaking winter patrolling.
3. The sanctuary lacks in approved management plan to guide and prioritise various management inputs for effective delivery of outputs in tune with the management objectives of the sanctuary.
4. The local community have no rights in the sanctuary. Even so, local and other herders graze livestock in the alpine areas.
5. The current staff strength and available facilities are not sufficient for the tough terrain of the sanctuary.
6. No attempt has been made to carry out a robust scientific exercise to monitor important wildlife populations in the sanctuary systematically.
7. Awareness is lacking among the local community.

Immediate Action Points

1. The management plan of the sanctuary (under preparation) may be finalised soon and approval obtained from the competent authority at the earliest.
2. Rapid surveys or estimates based on robust methods must be conducted or made now. The information obtained must be used in preparing the management plan of the sanctuary.
3. The state government may consider increasing the strength of the field staff, providing more field gear and vehicles for winter patrolling and developing the capacity of the staff to undertake patrols in winter.
4. The sanctuary is located in a high-altitude area that remains covered in snow for about 6 months in a year, and the period available for undertaking management-related

works is short. The government may consider relaxing the procedural context by exempting the condition of calling for tenders for works. This procedure is time consuming. The government may also provide funding support in a timely manner for undertaking management activities in the short period of time available.

Evaluators
Dr. V.K. Melkani, Former CWLW, Government of Tamil Nadu
Dr. Vibhu Prakash, Scientist, Vulture Breeding Centre, BNHS
Dr. Jeet Ram, Professor, Kumaun University, Nainital
Dr. K. Sivakumar, Scientist-F, WII

JAMMU & KASHMIR

MEE Team of Northern Region evaluated 7 sanctuaries of Jammu & Kashmir. Detailed report of each NP&WLS discussed separately. The specific recommendations in brief are given below:

1. While Nandini Wildlife Sanctuary falls in the Lower Shivalik Range, the other two PAs are high altitude areas which are under snow cover for six months during the winter season.
2. The period of execution of many management activities is limited and calls for early release of funds to these PAs.
3. The Management Plan for all these PAs will have to be finalized and approved by the Competent Authority at the earliest. It was informed that the Plans are under preparation. The Team could see the draft Plan for Overa-Aru Wildlife Sanctuary.
4. Since no estimation details of the population of important wildlife has been done so far (except for KHANP way back in 2006), it is very essential that rapid surveys/population estimation at least of the key species of the PAs following robust scientific methods is conducted now and on subsequent periods to know the population trends. This information will be of immense for the Management Plan of these PAs which are under preparation now.
5. The levels of Human-Wildlife Conflict in the zone of influence (5 Km. from the sanctuary boarder) is high, causing human death, injury, crop damage and livestock killing.
6. The package of compensation approved by the government does not cover crop damage by wildlife and killing of livestock. The government may consider providing appropriate compensation for these cases. It is available in many other states. And local people demand appropriate compensation for crop damage and loss of livestock.
7. For the high-altitude areas like KHANP and Overa-Aru Wildlife Sanctuary, which are under snow cover for more than six months during winters. The period of work available is very short. The government may consider to relax some of the procedural protocols like calling for tenders which consumes much time as a special case for such remote and snow bound areas.
8. Cattle grazing (specially sheep and goats) by the nomadic as well as the local herder's pose threat to KHANP and Overa-Aru Wildlife Sanctuary. The assessment of the number of cattle by the herders and the population trend of cattle is lacking in the Management Plan. It is suggested that workable management interventions e.g. rotational grazing, closure of unique habitats, creation of better awareness among the herders, examining alternative options for livelihood enhancement to the community which may encourage them to reduce numbers of cattle over a period of time may be attempted.

9. Some of the PAs have undergone the process of reorganization through rationalization of their boundaries like KHANP. There is large enhancement of its extent now compared to original notification. It is therefore, suggested that the data base of PA Network maintained by WII may be accordingly revised in coordination with the State Government and MoEFCC.

10. **Nandini Wildlife Sanctuary:** As per the notification of Nandini wildlife sanctuary (SRO. 137 Dt. 10.04.1990), the sanctuary has an extent of 33.34 Km^2 but as per the discussion with the Wildlife Warden and as per the map provided the current extent which is managed by the warden is only 14.28 Km^2. The handing over of the area under the control of Jammu forest division to the sanctuary as per the notification may be at least now expediated at the appropriate level by following the required procedures. If due to some compelling circumstances it is not feasible the revised notification of the sanctuary may be initiated by following prescribed procedures.

11. **Kishtwar High Altitude National Park (KHANP):** The National Park was established in 1990 over an extent of 425 Km^2. In 2015, the government reconstituted the KHANP. Revised area of KHANP after rationalization of boundaries is 2191.50 Km^2. The issue of settlement of rights of the excluded villages and delineation of Park boundaries is with Assistant Commissioner (Rev) for issuance of final notification by the Govt. The progress in this regard may be closely followed up by the Park authorities for early final Notification of the National Park.

12. **Overa-Aru Wildlife Sanctuary:** The sanctuary is located in contiguity to Dachigam National Park which hold the last viable population of critically endangered Hangul and sanctuary provides important corridor for Hangul and other important species. Further, the sanctuary is also contiguous with other two PAs – Thajwas WLS and Shikargah/Pannyer Conservation Reserve make the sanctuary a large landscape for long term conservation of wildlife, the estimation of Hangul is essential and may be carried out jointly by all PA Managers of the area.

13. Since, the sanctuary is close to Pahalgam, a famous tourist destination has potential for promoting sustainable eco-tourism involving community in order to assist them in livelihood enhancement and nature conservation consciousness to the visitors. The draft chapter in the Management Plan (under preparation) may be suitably modified with technical inputs from some experts.

14. The new Management Plan for three Sanctuaries namely Ramnagar Rakh, Surinsar-Mansar and Rajparian (Daksun) are under preparation. It is recommended that it should be prepared as per the guidelines of Wildlife Institute of India as well as to cope up with the present and incoming challenges specially for habitat, protection and tourism, climate /ecology change management.

15. In all the Sanctuaries visited by the Committee it was found that there is shortage of field Staff, infrastructure and vehicle etc. for proper management of each Sanctuary. The specific recommendation for each Sanctuary as mentioned in the Chairman's Report need to be followed and Sanctioned.

16. At present no anti-poaching Camp is established within the Sanctuary. Field Staff move from outside for patrolling. This is not very effective way of protection and Management of Sanctuary. As suggested in Chairman's Report for different Sanctuaries the anti-poaching camps with numbers mentioned in the report to be established within the Sanctuary for effective protection and study of animal movement, their behavior and habitat. Patrolling from outside to be additional activity.

17. In all the Sanctuaries, adequate fund to be provided for removal of Lantana -camara species and area to be planted with indigenous fruit and fodder species.

18. People's co-operation is very essential to check encroachment, deforestation, forest fire, large scale grazing and poaching etc. Therefore, constitution of Eco development Committees is very essential in villages within and periphery of the Sanctuary and Wildlife Warden to seek fund under various schemes for Eco- development activities. This may be attended on priority.

19. Govt. of Jammu and Kashmir to kindly consider exempting Forest Department in general and Wildlife Organization in particular from the purview of 'Tender System' of executing the work in the field and allowing the old system of Muster Roll. Otherwise it will kill the JFM initiative specially the Eco development concept for protection of Forests and Wildlife.

20. Concern of Wildlife warden and other front-line subordinate staff as well as of daily wages labourers concerning to their promotion, regularization and full wages to be addressed on priority to boost their morale for effective protection of Wildlife and their habitat.

21. The researches and documentation need to be promoted. Regular periodic bio- diversity assessment of Sanctuary is required to be under taken with the help of field staff and Students of Kashmir University under the guidance of wildlife trained faculty of Kashmir University. Research Officer posted in the office of the CWLW should take up other research projects as per the requirement of the management.

22. Field Staff and Members of Eco-development Committee need to be sent outside State for exposure visit to study how wildlife management is being done.

23. In respect of Ramnagar Rakh Sanctuary Jammu, the remaining area of Sanctuary equal to 23 Sq. km. should be immediately transferred to Wildlife Warden, Jammu for better management or else

24. The Chain link mesh fencing within the Sanctuary to be removed for smooth movement of wildlife within Ramnagar Rakh Sanctuary.

25. In Surinsar-Mansar Sanctuary, on both the ends of NH passing through Sanctuary, there should be proper barrier and office for regulating the entry of people, tourists and vehicle as per provisions of Wildlife Protection Rules.

26. Tourism need to be regulated. Provisions of Wildlife (Protectiono Act to be displayed through signages at different places to check the disturbances within Sanctuary.

27. Surinsar-Mansar Development Authority should not execute any activity within Sanctuary without the approval of Wildlife Warden who after scrutiny if satisfied that activity is permissible within the ambit of Wildlife (Protection) Act, may accord approval. Wildlife Warden should take up all eco- tourism activities from the funds provided by Tourism Deptt.

28. The 'Govt. owned Sheep Breeding Farm' within Rajparian WL Sanctuary to be relocated outside the Sanctuary immediately as it is very detrimental to wildlife Management.

29. Orders of Hon'ble Supreme Court of India stated to have been issued for de notification of Trikuta Sanctuary may be provided to Wildlife Organisation of J&K. If any condition has been imposed for implementation by State Govt. same may be implemented by Govt.

30. If Hon'ble Supreme Court is specific for de notification of Sanctuary, State Govt. to kindly issue formal de notification order.

31. State Govt. to also take steps for protection and management of wildlife within the area of Shrine Board for which Trikuta WL Sanctuary was declared.

18. Kishtwar High Altitude National Park, Jammu & Kashmir
MEE Score- 60% (Good)

Management Strengths

1. Kishtwar High Altitude National Park (KHANP) is known for its unique and highly diverse flora and fauna. It is well known as harbouring two highly endangered deer species, the Hangul (*Cervus elaphus hangul*) and Musk Deer (*Moschus chrysogaster*). Many other rare and endangered herbivores and carnivores such as the Asiatic black bear, Himalayan brown bear, goral, Himalayan langur, leopard, snow leopard and ibex and important bird species such as the Western tragopan, monal, golden eagle, snow partridge and chakor are also found in the park.
2. There are no habitations inside the sanctuary after the reorganization of the national park.
3. The park is inaccessible because of its remoteness and high elevation and the permanent snow cover of its peaks. The tough terrain and harsh conditions help protect the rich biodiversity of the park.
4. The local people are supportive of the conservation efforts undertaken by the park authorities. The staff, working under difficult conditions, are held in high esteem.

Management Weaknesses

1. The park and its surrounds are intensely grazed in summer by Gujjars and other local livestock holders. This grazing pressure is one of the limiting factors of the wildlife.
2. It is believed that there are high levels of human-wildlife conflict in the zone of influence (up to 5 km from the park border), causing human death and injury, crop damage and killing of livestock.
3. The current strength of the staff and the facilities of the sanctuary are not adequate.
4. The people are unaware about wildlife conservation.
5. No scientific exercise based on robust methods has been carried out to monitor important wildlife populations and analyse population trends in the sanctuary for a long time now. Consequently, one of the major management issues of KHANP is lack of adequate baseline information relating to ecological and socio-economic components.

Immediate Action Points

1. The nature and extent of the rights of the people relating to land within the re-defined boundary of KHANP in 2015 is under process by the Assistant Commissioner (Rev) under Section 20 and other related provisions of the J&K Wildlife Protection Act, 1978 for the issuance of the final notification by the government. The progress in this regard may be followed up by the park authorities to have the final notification of the national park issued soon.
2. The development of the management plan of KHANP with the boundary re-defined may be expedited. The development of the plan by WWF, who have been entrusted with this task, may be followed up, and the approval of the plan by the Chief Wildlife Warden may be obtained in due course of time. A stakeholder consultation may be held before the plan is written.
3. Since no scientific estimation of the populations of important wildlife has been performed so far, rapid surveys based on robust methods should be conducted now

and the information obtained used to prepare the draft management plan of the sanctuary.

4. The state government has provided support and funding to develop the infrastructure, equipment and personnel required to curb the growing human–wildlife conflict in Chenab Wildlife Circle. The support may be continued. The funds needed for paying compensation may be released by the government in advance as many claims in the field are awaiting settlement.
5. The package of compensation approved by the government does not cover crop damage by wildlife and killing of livestock. The government may consider providing appropriate compensation in these cases as in many other states. Local people are demanding compensation for crop damage and loss of livestock.
6. Since most of the area is under snow cover for more than 6 months during winter, the period available for work is very short. The government may consider relaxing some of the procedural protocols in remote and snow-bound areas as these are time consuming.

Evaluators
Dr. V.K. Melkani, Former CWLW, Government of Tamil Nadu
Dr. Vibhu Prakash, Scientist, Vulture Breeding Centre, BNHS
Dr. Jeet Ram, Professor, Kumaun University, Nainital
Dr. K. Sivakumar, Scientist-F, WII

19. Nandini Wildlife Sanctuary, Jammu & Kashmir
MEE Score- 54.31% (Fair)

Management Strengths

1. Nandini Wildlife Sanctuary, in its current extent (14.28 km²), does not experience high levels of anthropogenic pressure. Only one village is situated within the sanctuary, and this village has only a small number of households.
2. After the new highway between Jammu and Srinagar was opened, the vehicular traffic on the old Jammu– Srinagar road, which passes through the sanctuary, has decreased. This has proved to be beneficial to the management of the sanctuary.
3. The sanctuary is close to Jammu, but because of the new highway between Jammu and Srinagar, the influx of tourists has reduced considerably.

Management Weaknesses

1. As per the notification of Nandini Wildlife Sanctuary (SRO. 137 Dt. 10.04.1990), the sanctuary has an extent of 33.34 km²,but it transpires from a discussion with the Wildlife Warden and as per the map provided the current extent which is managed by the Warden is only 14.28 km². The remaining area of the notified sanctuary is yet to be handed over to the Wildlife Department by the Jammu Forest Division. It was also learnt that there are many villages in the area that are yet to be handed over to the Wildlife Department.
2. Though the sanctuary has been in existence for more than 28 years now, there is no approved management plan in place to guide and prioritise various management inputs for the effective delivery of outputs in tune with the management objectives of the sanctuary.
3. The current staff are managing the current extent of the sanctuary with the available facilities. Considering the human-wildlife conflict issues and the rescue and mitigation efforts that will have to be managed, the strength of the staff may need to be increased.

4. No exercise has been carried out to monitor important wildlife populations in the sanctuary so far.

Immediate Action Points

1. The handing over of the area under the control of the Jammu Forest Division to the sanctuary as per the notification may be expedited.
2. The management plan of the sanctuary may be prepared at the earliest including of the area left out as of now for holistic management of the sanctuary.
3. Rapid surveys or estimates based on robust methods should be conducted and the information obtained may be used in the management plan of the sanctuary.

Evaluators

Dr. V.K. Melkani, Former CWLW, Government of Tamil Nadu
Dr. Vibhu Prakash, Scientist, Vulture Breeding Centre, BNHS
Dr. Jeet Ram, Professor, Kumaun University, Nainital
Dr. K. Sivakumar, Scientist-F, WII

20. Overa-Aru Wildlife Sanctuary, Jammu & Kashmir
MEE Score- 57.50% (Fair)

Management Strengths

1. The sanctuary is contiguous with Dachigam National Park, which holds the last viable population of the critically endangered Hangul. The sanctuary provides an important corridor for the Hangul and other important species.
2. The sanctuary is also contiguous with two other protected areas - Thajwas Wildlife Sanctuary and Shikargah/Pannyer Conservation Reserve, and with them constitutes a large landscape for long-term conservation of wildlife.
3. The sanctuary is known for its unique and highly diverse flora and fauna.
4. The high-altitude lakes and glaciers in the sanctuary make it hydrologically valuable.
5. There are no habitations inside the sanctuary.
6. The sanctuary is close to Pahalgam, a famous tourist destination. There is potential for promoting eco-tourism with the involvement of the community, which may enhance their livelihoods.

Management Weaknesses

1. The sanctuary experiences heavy pressure during summer due to grazing by animals of Gujjars and other local livestock holders and in spring due to collection of *guchhi* (mushroom) by the locals. This pressure is one of the main limiting factors for the wildlife.
2. The levels of human-wildlife conflict in the zone of influence (up to 5 km from the sanctuary boundary) are high and lead to human death and injury, crop damage and killing of livestock.
3. The current staff strength and the facilities of the sanctuary are not adequate.
4. The people are not aware about wildlife conservation.
5. No scientific exercise based on robust methods has been carried out to monitor important wildlife populations and analyse population trends in the sanctuary so far.

Immediate Action Points

1. The chapters on eco-tourism and zonation in the draft management plan for the period from 2020–21 to 2024–25 may be considered for modification and submitted to the Chief Wildlife Warden for approval well in time.

2. Since no estimation of the populations of important wildlife species has been carried out so far, rapid surveys or estimates based on robust methods should be conducted now. The information obtained can be used in the draft management plan of the sanctuary.
3. The package of compensation approved by the government does not cover crop damage and killing of livestock by wildlife. The government may consider providing appropriate compensation in these cases as is done in many other states. Local people are demanding compensation for crop damage and loss of livestock.
4. Since most of the area is under snow cover for about 6 months during winter, the period available for work is short and calls for relaxing some of the procedural protocols.

Evaluators
Dr. V.K. Melkani, Former CWLW, Government of Tamil Nadu
Dr. Vibhu Prakash, Scientist, Vulture Breeding Centre, BNHS
Dr. Jeet Ram, Professor, Kumaun University, Nainital
Dr. K. Sivakumar, Scientist-F, WII

21. Rajparian (Daksum) Wildlife Sanctuary, Jammu & Kashmir
MEE Score- 54.17% (Fair)

Management Strengths

1. Rajparian Wildlife Sanctuary has ecological and geomorphologic significance due to its diverse fauna and flora and its proximity to Sinthan Pass, one of the gateways to the Kashmir Valley.
2. It provides suitable habitats for several mammalian species such as the Kashmir Musk Deer, Himalayan Brown Bear, Asiatic Black Bear, Himalayan Serow and Common Leopard.
3. The sanctuary is home to some rare and endemic bird species such as the Kashmir Flycatcher, Kashmir Nuthatch, Orange Blue Finch, Golden Eagle and Bearded Vulture.
4. The Rajparian stream, running through the sanctuary, forms an important tributary of the Bringi drainage, which supplies drinking water to the entire area and also irrigates agricultural lands.
5. There is no village within the sanctuary, and it is free of biotic pressure.
6. The grasslands, river system, forests and mountains provide a beautiful landscape where eco-tourism can be developed for creating awareness among the masses for conservation of forests and wildlife.

Management Weaknesses

1. The staff strength is quite inadequate vis-à-vis the extent and importance of the sanctuary.
2. The government-owned sheep breeding farm established within the sanctuary is a constant source of disturbance and is a potential threat to the survival of wildlife.
3. There is severe grazing pressure in the sanctuary, especially during the summer, due to the domestic cattle and sheep owned by the nomadic Gujars and Bakerwals, which affects the natural regeneration. This has led to degradation of the forests and has deprived the wildlife of food and fodder.
4. The eco-development committee initiative has suffered a setback due to the recent decision of the government to have all the work of the forest department executed by contractors through tenders. The age-old system of the forest department executing the work through a muster roll has been discarded. Thus, local people will be deprived of the opportunity of working in the sanctuary, which may affect the protection it enjoys and affects the association between the staff of the forest department and the local people.

5. The entire staff, from the Wildlife Warden to the daily wagers, are highly demoralised as they have no promotional avenues even after long years of service. The dissatisfaction amongst staff have affected their work ethics and the management of the sanctuary.
6. The daily wage workers involved in protection and other management-related work of the sanctuary, are not paid wages in time and this has affected their performance.
7. Anti-poaching camp has not been established within the sanctuary except at the entry gate.
8. There is no management plan for the sanctuary, hence the sanctuary is being managed in an ad hoc manner.

Immediate Actionable Points

1. The management plan under preparation, should be in accordance with the guidelines of Wildlife Institute of India and should include assessment of the threats and strategy to mitigate the challenges due to degradation of the habitat, protection, tourism and climate/ ecology change management issues.
2. The government-owned sheep breeding farm needs to be relocated outside the sanctuary immediately as it is very detrimental to the wildlife management in the sanctuary.
3. The infrastructure of the sheep breeding farm and the space vacated by it need to be utilised for developing eco-tourism facilities as the farm is located in a beautiful landscape.
4. There is a shortage of staff and the infrastructure is insufficient for the management of the sanctuary. One more post of Range Officer, two more posts of Forester and five more posts of Forest Guard need to be sanctioned for effective management of the sanctuary round the clock, including eco-tourism.
5. A minimum of five anti-poaching camps/anti-grazing camps need to be established inside the sanctuary to keep a watch over poachers and grazers. Here the field staff need to be duly assisted by daily wagers and must camp inside the sanctuary.
6. One vehicle need to be kept at the disposal of the Range Officer for patrolling in the sanctuary.
7. The people's co-operation is very essential to check encroachment, deforestation, forest fires and large-scale grazing. Therefore, constitution of eco-development committees is very essential in villages at the periphery of the sanctuary. The Wildlife Warden needs to seek funds under various schemes for eco-development activities.
8. The Government of Jammu & Kashmir may consider exempting the forest department in general and wildlife organisations in particular from the purview of the tender system for executing works and involve communities under eco-development programme for protection and management of sanctuary.
9. The concerns of the Wildlife Warden and other frontline subordinate staff members as well as those of daily-wage labourers about their promotion, regularization and timely payment of full wages need to be addressed on priority to boost their morale for effective protection of the wildlife and habitats.
10. Research and documentation need to be promoted. Periodic biodiversity assessments of the sanctuary need to be undertaken with the help of the field staff and students of Kashmir University under the guidance of wildlife-trained faculty members of Kashmir University. The Research Officer posted in the office of the CWLW should take up other research projects according to the requirements of the management.
11. The field staff and members of eco-development committees need to be sent outside the state for exposure visits to study wildlife management in other regions.

<u>Evaluators</u>

Shri S.S. Srivastava, Former PCCF & HoFF, Govt. of Odisha
Dr. D.S. Shrivastava, Former Professor, Patna University, Patna
Dr. Afifullah Khan, Professor, Aligarh Muslim University, Aligarh

Dr. V.P. Uniyal, Scientist-G, WII

22. Ramnagar Wildlife Sanctuary, Jammu & Kashmir
MEE Score- 57.50% (Fair)

Management Strengths

1. The sanctuary is located in within the city of Jammu.
2. There is support from the local people and those of adjoining villages for protection and conservation of forests and wildlife.
3. The sanctuary has a large population of rhesus macaque which cause nuisance to the public.
4. The sanctuary provides the local people a healthy climate and a pollution-free environment.
5. It is an important catchment of the river Tawi.
6. It is an important centre for creating awareness among the masses about protection and conservation of forests and wildlife.

Management Weaknesses

1. The staff are not trained in wildlife management, and hence they are unable to appreciate the importance of wildlife and its conservation.
2. A length of 15 km of the Jammu–Srinagar national highway passes through the sanctuary and is a major problem for wild animals that move towards the river Tawi for drinking water, especially during the summer.
3. There are hit-and-run cases involving wild animals on the national highway.
4. The chain link fence separating a part of the sanctuary for morning walkers and others is restricting the free movement of wild animals.
5. There is grazing pressure by domestic cattle and sheep owned by nomads such as Gujjars, Barkawals, Gaddis, Dodhi Gujjars and Changpans.
7. No anti-poaching camp has been established within the sanctuary and this has affected protection of the sanctuary.
8. Located in a city, the sanctuary is vulnerable to dumping of waste materials along the roads.
9. Local people have a ritual of feeding monkey, making these animals roam outside the sanctuary.
10. No staff members are present in the sanctuary when there are crowds of walkers in the morning. So these walkers break twigs and branches, pluck flowers, play music on their mobile phones, etc.

Immediate Actionable Points

1. The management plan under preparation, should be in accordance with the guidelines of Wildlife Institute of India and include assessment of the threats and strategy to mitigate the challenges due to degradation of the habitat, protection, tourism and climate/ ecology change management issues.
2. The remaining area of 23 km² notified as sanctuary should be immediately transferred to the Wildlife Warden, Jammu for better management.
3. The chain link fencing within the sanctuary is to be removed to permit unhindered movement of wildlife.
4. Adequate funds are to be provided for removal of *Lantana camara*, and the area is to be planted with indigenous plants.
5. Three Forest Guards need to be stationed, on the trail daily to enforce the laws of the sanctuary and to prevent the morning walkers from creating a disturbance.

6. The feeding of monkeys within and at the periphery of the sanctuary needs to be stopped immediately.
7. Six camera traps need to be installed within the sanctuary to study its biodiversity and to provide protection.
8. The rich biodiversity of the sanctuary serves as a lung for the Jammu city and should be protected by deploying adequate staff and infrastructure enhanced for effective functioning.
9. A minimum of two anti-poaching camps need to be established within the sanctuary so that the protection is improved and the habits and habitats of the wild animals can be studied regularly within the sanctuary.
11. The concerns of the frontline subordinate staff regarding their promotions and special pay, on par with the staff of the Forest Protection Force, need to be attended on priority.
12. As per the assessment six camera traps, five pairs of binoculars, two sets of drones, 11 GPS, one four-wheel vehicle (for the Range Officer), and one rescue van and motor cycle for each forester serving in the sanctuary are needed. These need to be provided immediately.
13. Research and documentation need to be promoted. Periodic biodiversity assessments of the sanctuary need to be undertaken with the help of the field staff and students of Jammu University under the guidance of wildlife-trained faculty members of Jammu University. The Research Officer posted in the office of the CWLW should take up other research projects according to the requirements of the management.
14. Since the local villagers are already supporting the Division Staff in protecting the wildlife and habitats, an eco-development committee needs to be constituted immediately under JFM in the adjacent villages. The DFO needs to seek funds under various schemes for eco-development activities.
15. The school of Khanpur village, located in the foothills in the sanctuary needs to be saved from landslides and erosion. These problems need to be addressed immediately as the villagers are supporting the staff in protecting and conserving the wildlife and habitats.
16. There is a need to create cattle pounds to control illicit grazing and impounding cattle violating sanctuary rules.

Evaluators
Shri S.S. Srivastava, Former PCCF & HoFF, Govt. of Odisha
Dr. D.S. Shrivastava, Former Professor, Patna University, Patna
Dr. Afifullah Khan, Professor, Aligarh Muslim University, Aligarh
Dr. V.P. Uniyal, Scientist-G, WII

23. Surinsar–Mansar Wildlife Sanctuary, Jammu & Kashmir
MEE Score- 51.66% (Fair)

Management Strengths
1. The sanctuary harbours the sub-Himalayan biodiversity including threatened and endangered plant and animal species.
2. It is an important catchment for a number of streams and *nallas* draining into the river Tawi.
3. Two important lakes, namely Surinsar and Mansar, which are Ramsar sites, are located within the sanctuary.
4. The two lakes attract large numbers of migratory birds in winter.
5. The sanctuary is an important attraction for tourists also.
6. There is support among the local people from adjoining villages for the protection and conservation of the two lakes.

7. Since the sanctuary, specifically the two lakes, attract large numbers of tourists, there is vast potential for creating awareness about conservation of wildlife and its habitats among people.

Management Weaknesses

1. The staff strength is quite inadequate and the staff are not trained in wildlife management, and hence they are unable to appreciate the importance of wildlife and its conservation.
2. A national highway passes through the Sanctuary and causes disturbance to animals and affects their movement in the sanctuary.
3. There is severe grazing pressure in the sanctuary, particularly during winter, from domestic cattle and sheep owned by the nomadic Gujjars. The grazing affects the natural regeneration of vegetation, leading to degradation of the forests.
4. The habitations in the catchment area of the two lakes is exerting considerable pressure on the water bodies. A considerable amount of waste material enters the lakes in the form of kitchen refuse, detergents and animal excreta.
5. The activities of the Surinsar–Mansar Development Authority are quite detrimental to the management of the sanctuary.
6. No eco-development committee has been constituted, and hence there is no participation of the local communities in the management of the sanctuary.
8. Anti-poaching camp has not been established within the sanctuary except near
1. the two lakes from where patrolling is done.
9. There is a lack of veterinary care for wild animals as well as for the domestic cattle to be found in the forests.
10. The management plan has not been revised for the sanctuary and the old plan can not address current management issues.

Immediate Actionable Points

1. The management plan under preparation, should be in accordance with the guidelines of Wildlife Institute of India and should include assessment of the threats and strategy to mitigate the challenges due to degradation of the habitat, protection, tourism and climate/ ecology change management issues.
2. Check post need to be established at both ends of the national highway passing through the sanctuary to regulate the entry of people, tourists and vehicles as per the rules of the sanctuary.
3. There is a shortage of staff and infrastructure for management of the sanctuary. One more post of Range Officer, three more posts of Forester and five more posts of Forest Guard need to be sanctioned for effective management of the sanctuary, including eco-tourism.
4. Two four-wheeled vehicles, including one rescue vehicle, four motor cycles, four boats (two for each lake), 20 camera traps, 10 pairs of binoculars and two spotting scopes (one for each lake) are required to manage the sanctuary better.
5. The fund flow is quite erratic. The CSS funds need to be released promptly within the financial year. The Government of Jammu & Kashmir needs to pay special attention in this regard.
6. The people's co-operation is very essential to check the encroachment, deforestation, forest fires, large-scale grazing and discharge of garbage into the two lakes. Constitution of eco-development committees in the villages within the sanctuary and on the periphery is essential for ensuring their co-operation as well for the DFO to seek funds under various schemes for eco-development activities.
7. A minimum four anti-poaching camps need to be established within the sanctuary for affording better protection and for studying the habits and habitats of wild animals

regularly within the sanctuary, apart from the routine visits of the patrolling staff from Surinsar or Mansar.

8. The concerns of members of the frontline subordinate staff about their promotion and special pay, adequate number of residences and barracks, etc. need to be addressed on priority.
9. Research and documentation need to be promoted. Regular periodic biodiversity assessments of the sanctuary need to be undertaken with the help of the field staff and students of Jammu University, under the guidance of wildlife-trained faculty members of Jammu University. The Research Officer posted in the office of the CWLW should take up other research projects according to the requirements of the management.
11. The tourism needs to be regulated. The provisions of the Wildlife (Protection) Act are to be notified through information boards at different places to facilitate compliance of the rules.
12. The crematorium adjacent to Mansar lake needs to be shifted immediately as it is polluting the lake.
13. The Surinsar–Mansar Development Authority should not be allowed to carry on any activity within the sanctuary without the clearance under Forest Conservation Act, 1980.
14. The Wildlife Warden should take up all eco-tourism activities using funds provided by the tourism department.

Evaluators
Shri S.S. Srivastava, Former PCCF & HoFF, Govt. of Odisha
Dr. D.S. Shrivastava, Former Professor, Patna University, Patna
Dr. Afifullah Khan, Professor, Aligarh Muslim University, Aligarh
Dr. V.P. Uniyal, Scientist-G, WII

24. Trikuta (Vaishnov Devi) Wildlife Sanctuary, Jammu & Kashmir
Not Evaluated

The Trikuta (Vaishnov Devi) Wildlife Sanctuary located in Reasi district of Jammu region of J&K, was notified as per the Cabinet decision no. 35 dated 02.02.1981 as one of the Sanctuaries among 4 Sanctuaries, 2 National Parks, 8 Game Reserves,11 Wetland Reserves and 2 Bio-Sphere Reserves notified under Section 17(1) of J & K Wildlife (Protection) Act 1978 vide Government Order No. FST/20 of 1981 dated 4th Feb.1981.

As Trikuta (Vaishnov Devi) Wildlife Sanctuary is not existing on the ground so assessment is not possible and not done. From the date of Notification till date this Sanctuary has never been managed as Sanctuary as the land of the Sanctuary was not transferred to Wildlife Organization or the Forest Department of Government of Jammu & Kashmir.

This land has been the proprietary land of Shri Mata Vaishnov Devi under the administrative control of Shri Mata Vaishnov Devi Shrine Board.

As per the prevailing direction of Hon'ble Supreme Court and guidelines of Govt. of India MOEF, Shri Mata Vaishnov Devi Shrine Board moved an application dated 20.12.2010 before J&K State Board of wildlife for de-notification of Trikuta (Vaishnov Devi) Wildlife sanctuary and the Wildlife Board in its meeting held on the same date gave its consent to the proposal of de-notification of the aforesaid Wildlife Sanctuary subject to certain conditions i.e. State Forest deptt. was required to identify three alternate sites and the State would issue the notification u/s 17(1) of J&K Wildlife (Protection) Act 1978 which shall be equal or double the area proposed to be de-notified from Trikuta (Vaishnov Devi) Wildlife sanctuary.

The proposal for de-notification was also placed before Standing Committee of the National Board of Wildlife which in its 22nd meeting held on April 25, 2011 also recommended for de-notification of the Sanctuary subject to certain conditions furnished below:

(i) The State Government will ascertain the extent of area of the Sanctuary sought to be used for non-forestry purposes based on a detailed Master Plan, and pay NPV as per extant orders for the forest land to be diverted.
(ii) Twice or more area than that of the Sanctuary will be identified and notified simultaneously as a sanctuary area while denotifying the present Sanctuary.
(iii) 5 % of the project cost corresponding to the project area falling within the Protected Area, would be paid by the user agency for the development of the sanctuary.

Subsequently State Govt. vide SRO No. 47 dated 30.01.2012 declared its intention to make an area 6627 ha adjacent to the Hirapur Wildlife Sanctuary as Tatakuti Wildlife Sanctuary in lieu of Trikuta Wildlife Sanctuary.

Shrine Board then moved to Hon'ble Supreme Court for seeking permission for the de notification of sanctuary. As per the newspaper report provided by Wildlife Warden Jammu, considering the above facts and hearing the Counsel for Shrine Board Shri Gaurav Pachnanda and Mr. A D N Rao, Amicus Curiae, the Hon'ble Supreme Court delivered the detailed order allowing the interim application and granting the permission as prayed by Shrine Board i.e. the de notification of entire Sanctuary.

Thus, Sanctuary is not existing although there is no formal de-notification order of State Govt. The land is under the control of Mata Vaishnov Devi Shrine Board with no wildlife management.

Management Strengths

1. The sanctuary is endowed with rich flora and fauna. The important fauna comprises of Leopard, Goral, Common Langur, Peafowl, Red Jungle Fowl, Cheer Pheasant and Chukar. The vegetation includes Cheer forests along the higher slopes and scrub forests on the lower portion. The plant species include *Berberis*, *Garna*, *Santha* (*Dodonaea viscosa*), *Branker* (*Adhatoda vasica*), *Mallotus philippensis*, *Amla*, *Khair*, *Acacia modesta*, *Kakoa* and *Kambal*.
2. The sanctuary is an important catchment for a number of streams and *nallas*.
3. The vegetation provides a good environment for pilgrims and helps combat the pollution emanating from the human population, vehicles and construction activity.

Management Weaknesses

1. This ecologically rich sanctuary is being de notified.
2. There is no scheme for protecting the wildlife of the area for which Sanctuary was notified.
3. The management does not have a copy of the denotification order of the Hon'ble Supreme Court and are confused about its status.

Immediate Actionable Points

The declaration of Trikuta (Vaishnov Devi) Wildlife Sanctuary was based on the fact that the area is of adequate ecological, faunal, floral, geomorphological, natural and zoological significance and needs protection, and it is site-specific.

The decision to de notify the sanctuary is in the interest of management of the temple and its devotees, but it does not serve the purpose of protection of wildlife and habitats. Creation of another sanctuary, namely Tatakuti Wildlife Sanctuary, in the Srinagar region, in lieu of Trikuta Sanctuary, far from this area, is not going to solve the problems of the wildlife of Trikuta Wildlife Sanctuary. Since the extent of Trikuta Wildlife Sanctuary is comparatively

large (1,44,340 Kanal and 19 marlas (31.40 km²), the following recommendation may be considered.

1. The management should procure the copy of the order of the Hon'ble Supreme Court and take up its implementation.
2. The management should seek clarification from the Government and formulate proposals in consultation with all stakeholders for the protection of the rich biodiversity of the area.
3. A wildlife management plan should be prepared to conserve the biodiversity of the Trikuta Hills. The management plan should be implemented by SMVDSB in association with the Chief Wildlife Warden, Jammu & Kashmir.

Evaluators
Shri S.S. Srivastava, Former PCCF & HoFF, Government of Odisha
Dr. D.S. Shrivastava, Former Professor, Patna University, Patna
Dr. Afifullah Khan, Professor, Aligarh Muslim University, Aligarh
Dr. V.P. Uniyal, Scientist-G, WII

PUNJAB

One of the MEE Team of Northern Region evaluated 5 sanctuaries of Punjab *viz*., i) Bir Motibagh, ii) Jhajjar Bacholi, iii) Nangal, iv) Takhni Rehmapur and v) Kathlour-Kushlian. Detailed report of each NP&WLS discussed separately. The specific recommendations in brief are given below:

1. Anti-poaching Camps need to be established within all the Sanctuaries where staff can stay round the clock for protection as well as to have an in-depth study about presence of various wildlife, their movement and behaviour.

2. Present Staff strength is quite meagre in all the Sanctuaries monitored by the Committee. It need to be enhanced as per details furnished in Chairman's report of each Sanctuary.

3. Vehicle and other infrastructure need to be augmented in each Sanctuary as suggested in report of the Chairman.

4. There is dearth of fund in each Sanctuary for the purpose of protection and management. Adequate fund to be provided to each Sanctuary for proper management of habitat, protection, creation and maintenance of infrastructure, Capacity building of Staff, training and awareness of villagers and school children, veterinary care of wild animals etc.

5. Existing Watch towers as well as new watch towers at convenient location near the water bodies to be maintained and created for protection, checking forest fire and study of animal behavior as well as for eco- tourism purposes.

6. All the Sanctuaries monitored are quite small in area and located as Island in the agricultural landscape. For better future of wildlife, efforts should be made to connect the Sanctuaries with other nearby forest areas or Sanctuary through natural chow/canals passing through the Sanctuary and entering into another forest area/Sanctuary by fencing both sides of chow/canals outside the Sanctuary.

7. Most of the Sanctuaries except Nangal are infested with Lantana and Parthenium spp., so there is need to remove them phase wise and blank area need to be planted with native food and fodders species.

8. To overcome the problem of drinking water within the Sanctuary specially in Bir Moti Bagh, Jhajjar Bacholi and Takhni Rehmapur, deep bore well as well as water bodies/water holes need to be created at suitable location for solving the drinking water problem of wild animals.

9. Since terrain in Jhajjar Bacholi and Takhni Rehmapur is quite undulating so soil and moisture conservation measures are required to be taken up on large scale specially series of check dams to be created in different Khads (Choes) passing through the Sanctuary. Similarly, in the Catchment area of Nangal, large scale soil and moisture conservation measures followed by plantation of native species are required to be taken up to check siltation of reservoir and providing good habitat to migratory birds.

10. Eco-development Committees to be constituted immediately in the adjoining villages of each Sanctuary. With the support of this Committee, DFO to take up large scale awareness among villagers to promote organic farming and discouraging use of chemical fertilizer and pesticides.

11. Two Interpretation Centres one at Kathlour and other at Nangal are required to be established for creating awareness among people and promoting ecotourism.

12. Eco -tourism activities to be started immediately in all the Sanctuaries for creating employment opportunities for local villagers and creating awareness among people for protection and conservation of forests and wildlife.

13. Govt. of Punjab to immediately constitute Local Advisory Committee as required under Section 33B of Wildlife (Protection) Act 1972 for involving local people in Sanctuary management.

14. Bir Motibagh Sanctuary is dominated by *Prosopis* species with dearth of food and fodder species. Prosopis spp. need to be removed in a phased manner. followed by plantation of native species.
15. All the feral cattle in Bir Motibagh Sanctuary need to be removed from Sanctuary and settled elsewhere. Government to take up this issue in a Project mode as number of Departments will be involved to solve this problem. Non-removal may lead to resource crunch for wild animals as the feral cattle are more dominating than any wild animal. Till this is achieved, these feral cattle may be confined in one corner of the Sanctuary to make space and resources available for wild animals.
16. Since there is dearth of predator in Bir Motibagh Sanctuary so male and female within the potential breeding pair of wild animals like Blue bulls etc. need to be separated to check population growth in Sanctuary with very small area.
17. The practice of food etc. being provided by local people to wild animals and feral cattle on religious grounds need to be stopped to preserve the wild instinct.

25. Bir Motibagh Wildlife Sanctuary, Punjab
MEE Score- 65% (Good)

Management Strengths
1. This Sanctuary is a green tract of forest near Patiala and influences the climate and hydrology of the area.
2. The sanctuary is an important repository of the biodiversity of the region though small in size and insular.
3. Being close to Patiala, it is a unique resource for creating awareness among people about the protection and conservation of forests and wildlife.

4. The sanctuary plays a refuge for the rhesus macaques that would have become a major problem in the city.
5. The fencing of the sanctuary has reduced the extent of man–animal conflicts.

Management Weaknesses

1. The sanctuary area is very small to harbor any large mammal population for long time, and it is also surrounded by agricultural fields.
2. Due to non-availability of suitable habitats, there is no major predator present. Therefore, there is proliferation of population of the Nilgai, macaque along with large number of stray cattle
3. The sanctuary is managed mostly as a refuge for monkeys, Nilgai and abandoned cattle, therefore prone to harbor wildlife diseases.
4. There is a lack of patrolling camps and staff within the Sanctuary, therefore there is a lack of stringent protection system. Inadequate funds for protection has also affected effective protection of the area.
5. The vegetation is dominated by *Prosopis* species, and lack of food and fodder species has made the habitat quite poor for wild animals.
6. The forest area is small and isolated, with no connectivity with other forests and sanctuaries. These factors pose a potential threat to the wildlife.

Immediate Actionable Points

1. Bir Motibagh Sanctuary is dominated by a *Prosopis* species, and there is a dearth of food and fodder species. The *Prosopis* needs to be removed in a phased manner. A restoration plan for the removal of this invasive species, followed by planting of native trees may be prepared and implemented by the Forest Department in this sanctuary as has been done in parts of Bir Mehas Wildlife Sanctuary. The required procedures need to be followed and robust monitoring protocols put in place for the work.
2. All the feral cattle need to be removed from the sanctuary and settled elsewhere. Government of Punjab need to take up this issue in a project mode as a number of departments will be involved in solving this problem. Non-removal may lead to a resource crunch for wild animals as the feral cattle are more dominant than any wild animal. Till the removal is achieved, these feral cattle may be confined in one corner of the sanctuary to make space and resources available for the wild animals.
3. Since there is a dearth of predators in the sanctuary, the potentially breeding male and female wild animals such as the Nilgai need to be separated to check the population growth in the very small area available.
4. Patrolling camps need to be established within the sanctuary to check illegal activities relating forest, wild life as well as to check entry of stray cattle. Staff members also need to stay within the sanctuary to accord round-the-clock protection as well as to conduct a detailed study about the presence of various wildlife species, their movements and their behaviour.
5. The present staff strength is quite inadequate and needs to be enhanced. A minimum of six posts of Forest Guard and two posts of Forester need to be sanctioned for the sanctuary for ensuring round the clock proper management of Sanctuary.
6. One veterinary doctor needs to be posted in Patiala Wildlife Division under the administrative control of the DFO (Wildlife) for the six sanctuaries and one zoo within the division.
7. Adequate funds need to be provided to the sanctuary for proper management of the habitat, for protection, for creation and maintenance of infrastructure, for building the capacity of the staff, for imparting training and creating awareness among villagers and school children, for providing veterinary care to wild animals, etc.

8. Watch towers need to be established at convenient locations near water bodies for protection, checking forest fires, studying animal behavior and eco-tourism.
9. Adequate numbers of camera traps need to be installed across the sanctuary to study the presence of various wild animals.
10. Efforts should be made to connect this sanctuary with other nearby forest areas or sanctuaries through natural *chows*/canals passing through this sanctuary and entering other forest areas/sanctuaries by fencing both sides of the *chows*/canals outside the sanctuary or by purchasing/acquiring land for the corridors.
11. The practice of the provision of food by local people to wild animals and feral cattle on religious grounds needs to be stopped to preserve the wild instincts of the animals.

Evaluators
Shri S.S. Srivastava, Former PCCF & HoFF, Govt. of Odisha
Dr. D.S. Shrivastava, Former Professor, Patna University, Patna
Dr. Afifullah Khan, Professor, Aligarh Muslim University, Aligarh
Dr. V.P. Uniyal, Scientist-G, WII

26. Jhajjar Bachauli Wildlife Sanctuary, Punjab

MEE Score- 64.17% (Good)

Management Strengths

1. This Sanctuary is a green tract of forest and influences the climate and hydrology of the area.
2. The sanctuary is an important repository of the biodiversity of the Shiwalik eco-systems.
3. Located in the foothills of the Shiwaliks Range of the Himalaya, the sanctuary is an important habitat for dispersing wild animals of the region.
4. It is an important resource of the state government for creating awareness among people about the ecological importance of forests and wildlife.
5. It is an important center for developing eco-tourism.

Management Weaknesses

1. The sanctuary is comparatively small, and it is surrounded by agricultural fields.
2. The wildlife habitat is dominated by *Acacia catechu*, and there is a dearth of other food and fodder species.
3. A black-topped *pucca* road called the Jhajjar Link Road, running through the south-western part of the sanctuary, is detrimental to the management of the sanctuary as vehicles of villagers pass along this road.
4. Lack of anti-poaching camps, staff members and night duty has affected the protection and other management activities.
5. The available funds, staff and infrastructure are quite meagre.
6. As a result of the isolated and small size of the forest and the lack of connectivity with other forests and sanctuaries, the future of the wildlife is potentially threatened.

Immediate Actionable Points

1. As the sanctuary is quite small in size and infested with scattered *Lantana* and *Parthenium* species, there is a need to remove these plants in a phased manner and plant open areas with native food and fodder species.
2. To overcome the problem of drinking water within the sanctuary, a deep bore well needs to be erected at a suitable location for providing water to all the waterholes using water tanks.

3. Since the terrain is quite undulating, soil and moisture conservation measures need to be initiated on a large scale. A series of check dams has to be created, in particular, in the three *khads* (*choes*) passing through the sanctuary.
4. Anti-poaching camps need to be established within the sanctuary. Staff members also need to stay within the sanctuary to accord round-the-clock protection as well as to gain a good understanding of the presence of various wildlife species, their movements and their behaviour.
5. The present staff strength is quite inadequate and needs to be enhanced. A minimum of three posts of Forest Guard and one post of Forester need to be sanctioned for the sanctuary.
6. Adequate funds need to be provided to the sanctuary for appropriate management of the habitat, protection, creation and maintenance of infrastructure, capacity building of the staff, training and creating awareness among villagers and school children, providing veterinary care for wild animals, etc.
7. The existing watchtowers need to be maintained.
8. About 10 camera traps need to be installed across the sanctuary to assess the presence and movements of wild animals.
9. A new vehicle needs to be provided to the DFO for protection and supervision work. In addition, one petrol vehicle needs to be provided to the DFO for patrolling purposes.
10. The tranquilizing guns of the sanctuary need to be replaced with new ones. The guns may be procured according to the requirements of the division.
11. Ropar Wildlife Division needs an interpretation center for creating awareness among people. A rescue center may be established at a convenient location with all the necessary infrastructure and one veterinary doctor is required for providing care and treatment for wild animals.
12. To ensure the survival of the wildlife in the future, efforts should be made to connect this sanctuary with other nearby forest areas or sanctuaries through the natural *choes* passing through it and other forests sanctuaries by fencing both sides of the *choes* outside the sanctuary.

Evaluators
Shri S.S. Srivastava, Former PCCF & HoFF, Govt. of Odisha
Dr. D.S. Shrivastava, Former Professor, Patna University, Patna
Dr. Afifullah Khan, Professor, Aligarh Muslim University, Aligarh
Dr. V.P. Uniyal, Scientist-G, WII

27. Kathlour Kushlian Wildlife Sanctuary, Punjab
MEE Score- 60.35% (Good)

Management Strengths
1. The vegetation of the sanctuary consists of species planted over a period of time. The sanctuary is located in the floodplains of the river Ravi; growth of indigenous natural species has occurred due to the protection afforded to the area.
2. The sanctuary, being located between the plains and the hills, is an important repository of the biodiversity of the hill and riverine species.
3. The sanctuary is essentially of planted species, but now it harbours important wildlife.
4. It provides shelter to various wild animals migrating from Himachal Pradesh as well as Pakistan, which lies across the border.
5. There is no dearth of water round the year for wild animals as the river Ravi and its tributaries cris-cross the sanctuary.
6. The sanctuary is an important resource of the state government for creating awareness among people about the ecological importance of forests and wildlife.

7. It is a very important center for developing eco-tourism.

Management Weaknesses

1. The sanctuary is disjointed by the fragmentation of area due to changing course of river Ravi. The major portion of Sanctuary i.e. Kathlour is situated on one bank of river whereas other part of Sanctuary i.e. is Kushlian is located on the opposite bank of the Ravi river.
2. The sanctuary has no major predators as a result, the populations of the herbivores are on the rise.
3. The sanctuary is surrounded by villages, so there is anthropogenic pressure for firewood and small timber. Poaching is also a management issue.
4. Anti-poaching camps are lacking, and Forest Guards and Foresters do not stay in or at the periphery of the sanctuary and affects the protection strategy.
5. The available funds, staff and the infrastructure are quite inadequate.
6. The isolated nature and small extent of the forest, along with the lack of connectivity with other forests and sanctuaries, pose a potential threat to the future of the wildlife.

Immediate Actionable Points

1. As the sanctuary is disjointed, it needs to be linked by raising plantation of suitable species in the river bed with appropriate technique.
2. As the sanctuary is infested with *Lantana*, the species needs to be removed in phases, and open areas need to be planted with native food and fodder species.
3. As villagers are very much affected about the Wild pig menace, an Eco Development Committee needs to be constituted urgently and funds provided to take up developmental works in the affected villages.
4. There is tremendous scope for developing ecotourism for livelihood opportunity.
5. Anti-poaching camps need to be established within the sanctuary. Staff members need to stay within the sanctuary round the clock to provide protection as well as to gain a good understanding about the presence of various wildlife species, their movements and their behaviour.
6. The present staff strength is quite inadequate and needs to be enhanced. A minimum of six posts of Forest Guard and two posts of Forester need to be sanctioned for the sanctuary.
7. Adequate funds need to be provided to the sanctuary for suitable management of the habitat, protection, creation and maintenance of infrastructure, capacity building of the staff, training, promoting awareness among villagers and school children, providing veterinary care for wild animals, etc.
8. The existing watch towers need to be maintained.
9. About 10 camera traps need to be installed across the sanctuary to assess the presence and movements of wild animals.
10. A new vehicle needs to be provided to the DFO for protection and supervision work. In addition, a petrol vehicle needs to be provided to the DFO for patrolling.
11. The Range Officer needs to be provided with a revolver.
12. Funds need to be made available for an interpretation centre at Kathlour for creating awareness among people.

<u>Evaluators</u>

Shri S.S. Srivastava, Former PCCF & HoFF, Govt. of Odisha
Dr. D.S. Shrivastava, Former Professor, Patna University, Patna
Dr. Afifullah Khan, Professor, Aligarh Muslim University, Aligarh
Dr. V.P. Uniyal, Scientist-G, WII

28. Nangal Wildlife Sanctuary, Punjab

MEE Score- 65.83% (Good)

Management Strengths

1. This protected wetland has an abundant animal life, and it is a rich area for waterfowl.
2. The sanctuary provides important feeding and nesting areas for a wide range of water birds.
3. The Nangal wetland offers a variety of habitats to different bird species throughout the year.
4. The sanctuary is an abode of several vulnerable species. These include the Ferruginous Pochard and Pallas's Fish Eagle.
5. The area has been important from the point of view of research as it offers a suitable place to study the flora, fauna and micro-organisms of the area.

Management Weaknesses

1. The water body is not solely under the control of the forest department. The ownership vests with the Water Resource Department and hence the management with dual authority is difficult.
2. There is no work round the year for the staff posted in this sanctuary. The activities in the sanctuary are restricted to a limited period starting with the arrival of birds, from October, till they leave, by February–March.
3. This wetland sanctuary is surrounded by agricultural fields where chemical fertilisers, pesticides and insecticides are used. Thus the sanctuary is prone to contamination with these chemicals, which are harmful to the birds and their food, the fishes and other organisms in the lake.
4. Sand mining is a concern that affects the ecology of the area.
5. Municipal sewage and factory waste released into the river Sutlej also pollute the water in the sanctuary, harming the birds.
6. The catchment drained by the river Sutlej and the surroundings of the lake are denuded and prone to erosion. Thus the life of the lake will be reduced.
7. The insufficient and irregular availability of funds and lack of staff is a critical problem which affects protection measure in the sanctuary.

Immediate Actionable Points

1. One anti-poaching camp needs to be established with sufficient staff during the period when birds are present in the lake.
2. An eco-development committee needs to be constituted immediately in the adjoining village, with the support of this committee, the DFO needs to take up large-scale awareness campaign among the villagers to promote organic farming and discourage the use of chemical fertilisers and pesticides.
3. The present staff strength is quite inadequate and needs to be enhanced. A minimum of three posts of Forest Guard need to be sanctioned for the sanctuary. The Forest Guards need to be posted in the sanctuary along with a minimum of 12 daily-wage staff members to provide protection effectively.
4. Large-scale plantation needs to be taken up along with soil and moisture conservation work in the catchment area of the lake and river to check soil erosion.
5. The discharge of sewage and factory waste into the river needs to be stopped immediately.
6. Adequate funds need to be provided to the sanctuary for management of the habitat, protection, creation and maintenance of infrastructure, capacity building of the staff, training, creating awareness among villagers and school children, providing veterinary care for birds round the year, etc.

7. Watchtowers need to be established in adjoining areas to study the birds as well as for general protection.
8. The watchtowers need to be fitted with high-resolution telescopes to study the birds and to create awareness among school children and other visitors.
9. A minimum of two boats need to be provided to the Range Officer for patrolling the reservoir. An adequate number of binoculars and other essential equipment are also needed.
10. An interpretation centre needs to be established at Nangal to create awareness among people.
11. Prominent hoardings need to be installed at different places in Nangal town as well on its approach roads to highlight the existence of the sanctuary and its ecological functions.

Evaluators
Shri S.S. Srivastava, Former PCCF & HoFF, Govt. of Odisha
Dr. D.S. Shrivastava, Former Professor, Patna University, Patna
Dr. Afifullah Khan, Professor, Aligarh Muslim University, Aligarh
Dr. V.P. Uniyal, Scientist-G, WII

29. Takhni Rehmapur Wildlife Sanctuary, Punjab
MEE Score- 68.33% (Good)

Management Strengths
1. The protected area is surrounded by agricultural fields that dominate the landscape and control the climatic factors and the hydrology of the tract.
2. The sanctuary is an important repository of the biodiversity of the Shiwalik eco-systems.
3. Located in the foothills of the Shiwalik Range of the Himalaya, the sanctuary is an important habitat that provides shelter to the migrating wildlife of the region and mitigates Human Wildlife conflict.
4. It is an important resource for creating awareness among people about the ecological importance of forests and wildlife.
5. It is an important resource of the state government for developing eco–tourism for creating employment opportunities for local people.

Management Weaknesses
1. The sanctuary is comparatively small and surrounded by agricultural fields.
2. There is a dearth of food and fodder species in the sanctuary.
3. The sanctuary is severely affected by soil erosion.
4. The sanctuary is badly infested with *Lantana*.
5. There are no anti-poaching camps, and there are no staff members present during the night. These factors affect the protection and general management of the sanctuary.
6. The available funds, staff strength and infrastructure are quite inadequate.

Immediate Actionable Points
1. As the sanctuary is comparatively small in area and infested with *Lantana*, the species needs to be removed in a phased manner and the open areas planted with native fruit and fodder species.
2. To overcome the problem of drinking water within the sanctuary, five more water holes need to be created within the sanctuary immediately.
3. Since the terrain is quite undulating and susceptible to soil erosion, soil and moisture conservation measures need to be taken up on a large scale throughout the sanctuary. Further series of check dams need to be created in the two *choes* passing through the sanctuary to ensure that water is available throughout the year.

4. Anti-poaching camps need to be established within the sanctuary. Staff members need to stay within the sanctuary to provide round-the-clock protection and to gain a deep understanding about the presence of various wildlife species, their movements and their behaviour.
5. The present staff strength is quite inadequate and needs to be enhanced. A minimum of four posts of Forest Guard and one post of Forester need to be sanctioned for the sanctuary.
6. Adequate funds need to be provided to the sanctuary for management of the habitat, protection, creation and maintenance of infrastructure, capacity building of the staff, training and creating awareness among villagers and school children, providing veterinary care for wild animals, etc.
7. The existing watchtowers need to be maintained.
8. About 15 camera traps need to be installed across the sanctuary to assess the presence and movement of wild animals.
9. Eco-development committees need to be constituted in the adjoining villages to reduce the dependence of the villagers on the sanctuary and to get their support for the management of the sanctuary.
10. Eco-tourism activities need to be started immediately to create employment opportunities for local villagers and to create awareness among people about protection and conservation of forests and wildlife. An interpretation centre, camping facilities on the periphery of the sanctuary, nature trails within the sanctuary and other infrastructure need to be created for this purpose.
11. The Government of Punjab needs to constitute immediately a local advisory committee as required under Section 33B of the Wildlife (Protection) Act 1972 to involve local people in the management of the sanctuary.

Evaluators
Shri S.S. Srivastava, Former PCCF & HoFF, Govt. of Odisha
Dr. D.S. Shrivastava, Former Professor, Patna University, Patna
Dr. Afifullah Khan, Professor, Aligarh Muslim University, Aligarh
Dr. V.P. Uniyal, Scientist-G, WII

UTTAR PRADESH

One of the team of Northern Region carried out MEE of 9 PAs in Uttar Pradesh during 2018-19. Out of these, six PAs are wetlands, one is river sanctuary and two are terrestrial areas of wilderness. Though each PA specific recommendations have been given separately, certain important issues which are very important for better management and conservation of wildlife in the state are summarized below expecting a concerted action by the state department/ government.

1. There is extreme shortage of frontline staff. More or less all the PAs visited are working at about 50% or less manpower of the sanctioned strength. Further none of the frontline staff is trained in wildlife conservation or having done any orientation course in wildlife conservation. Both recruitment, training and posting of trained young staff is one of the most important factor for the success of wildlife management and requires urgent attention of the state government. It is of utmost importance Ranipur and Sohelwa sanctuaries which are having immense potential.

2. Another issue is financial management involving meager financial grants, which are never timely released leading to clumsy implementation or surrender of grants. This issue can be

easily sorted with necessary sensitivity at the level of senior officers of the department. Efforts should be made to tap district level funding also.

3. Considering the paucity of funds, it is proposed to create a trust from collected entry fees for each protected area on the lines of Lucknow zoo or project tiger areas. This fund could be used under emergency situations.

4. Further, there are cases particularly in the Bundelkhand region where frontline staff has not been provided either uniform or any other protective gear for last six years or more leaving them highly demotivated. Such a situation needs urgent redressal.

5. Non-payment of compensation for the private lands that have been merged or declared part of sanctuary is an important irritant in getting local support. It needs to be done at the earliest.

6. None of the PA visited has its website. It leads to vacuum of authenticated information about the area which is a must for would be visitors. It must be immediately undertaken providing all the relevant information about PA and all the facilities, which are available for the tourist. It should also describe do's and dont's for the tourists.

7. Last but not the least is to prepare inventory of all the flora and fauna of the area. It is necessary to have linkages with local university/ college/ institutions for carrying out research studies to prepare inventory and other relevant subjects.

30. Jai Prakash Narayan (Surha Taal) Bird Sanctuary, Uttar Pradesh
MEE Score- 31.67% (Poor)

Management Strengths

1. The sanctuary lacks any attributes to qualify as management strengths. The management actions are done in an ad hoc manner.
2. The salient strength of the area is its connectivity to the river Ganges through a nullah, which if maintained clean will bring water to the sanctuary regularly, making it a perennial water body and a potential bird sanctuary. It has great potential but must be managed professionally.

Management Weaknesses

1. Though the sanctuary was notified in 1991, there is no demarcation on the ground even after 27 years. No effort has been made to prepare even a basic map based on preliminary revenue records.
2. The total area notified as a sanctuary is 3432.93 ha only, of which 3300.15 ha of land belongs to private persons and only 132.78 ha is Gram Samaj land. All the lands are intermingled. Even the Gram Samaj land is not demarcated on the ground. The private land belongs to 44 villages situated all around the notified area.
3. No settlement has been done so far, a Settlement Officer had been appointed only 4 months back.
4. There is heavy biotic interference, and the staff has virtually no control.
5. The whole division is working with less than 50% of the sanctioned staff. Two forest guards have been deployed for the sanctuary against a proposed strength of 26 in the management plan.
6. The range and division headquarters are at Varanasi, which is about 170 km away from the sanctuary, which is in Balia. The headquarters located far away has little or no control over the sanctuary. It is important to mention that there is a full-fledged social forestry division

headquartered at Balia, which can handle and control the sanctuary in a much more effective manner.
7. The financial resources provided to the sanctuary are very inadequate. These resources are not made available on a regular basis. Due to a lack of proper planning and monitoring, even the allocated funds are not spent fully.
8. No activity observed in the area was being carried out according to the management plan. Everything was being done in an ad hoc manner.

Immediate Actionable Points

1. It is not possible to manage the sanctuary with the present system. The sanctuary should should be brought under the control of the social forestry division at Balia for proper management. The entire staff strength should be transferred to the Ballia division.
2. Action must be taken immediately to prepare a basic map of the notified area. The Gram Samaj and private areas must be delineated. Activities such as removal of water hyacinth must be taken up on the Gram Samaj land, and once the process of settlement is completed, these should be extended to the remaining lands.
3. The Settlement Officer must complete the work, which has been pending for the last 27 years, immediately.
4. The forest department may consider converting the sanctuary into a community reserve considering the large extent of private land covered under the notification. The community reserve may be managed by the Gram Panchayat.
5. A work plan based on the prescriptions of the management plan must be put in place and implemented systematically according to the availability of funds.
6. Capacity building of the staff in wildlife management through short capsule courses should be conducted.

Evaluators
Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

31. National Chambal Wildlife Sanctuary, Uttar Pradesh
MEE Score- 59.17% (Fair)

Management Strengths

1. This sanctuary supports the largest population of the Gharial in the country, along with healthy populations of the Gangetic Dolphin, the mugger, eight species of turtles, otters. etc.
2. It is an Important Bird Area, having more than 300 species of migratory and resident birds.
3. Boating in the Chambal is an excellent way of watching Gharials, Muggers, turtles and a variety of birds.
4. There is minimal biotic interference in the river itself, but there is rampant grazing on the banks by local cattle.
5. There is a small Interpretation centre, which provides visitors good information about the sanctuary.
6. It is easily approachable and has a good network of roads.
7. Though no government facility is available for tourists, there are a few private river safari lodges nearby that provide a comfortable stay.

Management Weaknesses

1. Illegal sand mining is the most crucial threat to the endangered wildlife at the sanctuary.

2. There is a huge shortage of frontline staff and the frontline staff need to oriented towards active management through proper and frequent training.
3. The local populace does not participate in planning or management at any stage.
4. There is no scientific monitoring of the populations of the keystone species of the sanctuary, except the study made by Dr. S.A. Hussain (Wildlife Institute of India) and no recent scientific studies are being conducted in the sanctuary to help manage the flagship species better.
5. There is not apt public outreach as there is no functional website in place.

Immediate Actionable Points

1. The populations of flagship species of sanctuary and the habitats need to be monitored strictly to avoid repetition of the disasters of the past.
2. Chambal Wildlife Sanctuary needs more public outreach. A website giving all the details of the sanctuary along with information about the healthy populations of its flagship species must be created, and it must be updated regularly.
3. Linkages must be developed with universities and PG colleges. PG students and researchers must be roped in to undertake short-term studies designed in a systematic manner. These studies should look into population status of endangered flora and fauna, status of habitat, and to conduct socioeconomic surveys to assess the perception of local people.
4. The observations made by the staff different species in the river must be recorded. Records should be maintained and compared annually year after year to identify negative or positive trends.
5. A robust system of monitoring populations, egg-laying sites numbers of eggs laid annually by flagship reptiles and numbers of hatched juveniles released must be put in place.
6. An inventory of the flora and fauna of the river and adjacent areas must be prepared with help from appropriate organizations as indicated in the second point.
7. Tourism support from the government side needs to be initiated to address the requirement of all level of tourist. With sincere efforts, homestay sites could be developed by the local populace for middle class tourists. This will provide additional sources of income and generate support for the sanctuary.
8. Local youth should be encouraged to undergo training in birdwatching and basic aspects of aquatic conservation. After the completion of their training, they can be employed as local guides by the visitors.
9. The forest department must ensure that adequate funds are released in a timely manner for the sanctuary and that the members of the frontline staff are trained in the basics of wildlife management.

Evaluators
Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

32. Ranipur Wildlife Sanctuary, Uttar Pradesh
MEE Score- 39.16% (Poor)

Management Strengths

1. Ranipur Wildlife Sanctuary is a sizeable forest block without any habitations within the area.
2. The PA has a seasonal river passing through it. As a result, there are water bodies even during the summer/dry season.

3. The PA has been under a management plan for the last two decades.
4. The biodiversity of the sanctuary is representative of the Bundelkhand region.
5. Ranipur has good populations of the Sloth Bear and the Leopard.
6. It is located on the very popular religious tourism circuit of Chitrakoot.
7. It is well connected by road and rail.

Management Weaknesses

1. The sanctuary is heavily understaffed. There are only 14 personnel in place against the sanctioned strength of 36 field personnel.
2. The annual budget allocations is inadequate. During the last two years Rs.20–25 lakhs per annum was provided under central funding. Even the field staff have not been provided any uniforms and protection gear for the last 5 years or more. . The water in the staff colony is full of iron, and there is no filtration plant to address the issue.
3. None of the members of the field staff have been groomed or trained in wildlife conservation.
4. Since conditions are severe during summer in the area, forest fires are a big problem during the dry season. The staff members have not been provided with any gear for firefighting. Even basic things such as torches and batons are not made available to them.
5. There is no interpretation centre or any publicity material available for members of the public or for tourists who intend to visit the area.
6. There is heavy grazing pressure on the sanctuary, which impacts the biodiversity negatively. There is pressure for fuelwood and small timber as well in the fringe areas though the staff members did not provide any information about this.
7. There is an old wireless network that has been defunct for many years.
8. The area is heavily infested with Lantana.

Immediate Actionable Points

1. The PA manager must take advantage of the location of the sanctuary, which is on a religious tour circuit. The sanctuary must be made visible to the tourists visiting Chitrakoot through advertisements, pamphlets etc. A website must be created for the PA. This must provide all the important information about the area. Simultaneously, a tourist zone should be identified in the PA for visitors. Local people should be involved in the planning and implementation of wildlife tourism.
2. Local academic institutions be involved in preparing an inventory of flora and fauna of the PA. These institutions should also be involved in updating the inventory and in monitoring the flora and fauna. Important features of the inventory must be publicized.
3. The possibility of obtaining district-level funding for the PA should be explored. With the emphasis on development of Bundelkhand, such funding can be obtained easily. Wildlife tourism should be made part of the religious tourist circuit of Chitrakoot Dham. The entry fees charged at the sanctuary should be used for development of the sanctuary on the lines of Tiger foundations.
4. An interpretation centre providing details of the local biodiversity and its importance should be developed. To begin with it could be housed in a building that is available in Manikpur Range.
5. The infrastructure, in terms of the staff strength and the amenities provided to the staff, must be improved immediately by posting a few more personnel who are young and motivated. The staff should be well equipped to control fires, etc.
6. Short-term training in wildlife conservation should carried out for the staff by exposing them to the ideas and practice of modern wildlife management.

7. The grazing in the sanctuary needs to be controlled through rotational grazing. Improved varieties of milch cattle must be provided to villagers under different central or state schemes.
8. There is a need to create grasslands at appropriate areas in the PA for herbivores.
9. The defunct wireless system should be rejuvenated so that the communication in the sanctuary is improved.
10. Local stakeholders must be involved when undertaking any development activity for conservation in the PA.

Evaluators
Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

33. Saman Wildlife Sanctuary, Uttar Pradesh
MEE Score- 49.16% (Fair)

Management Strengths
1. This is a beautiful bird sanctuary. More than 100 bird species, both migratory and resident, are found in this sanctuary. The resident Sarus Crane is the flagship bird species. It can be seen throughout the year in and around Saman. It also happens to be the state bird of Uttar Pradesh.
2. The sanctuary has an updated and comprehensive management plan.
3. The sanctuary is easily accessible by road.
4. There are staff quarters at the site.
5. Counting of birds is carried out by the staff occasionally.

Management Weaknesses
1. More than 50% of the total sanctuary area of 526.3 ha is privately owned lands. No compensation has been paid so far for these lands, and this is causing disaffection among the local populace.
2. There are no staff members trained in wildlife management in the sanctuary.
3. The area is surrounded by villages and private lands, as a result of which there are conflicts at times.
4. During summer water becomes scarce, affecting the bird population.

Immediate Actionable Points
1. Regardless of the weaknesses, the sanctuary is surviving, and there is a need to take a planned, time-bound approach to action on the ground, taking cues from the existing management plan.
2. The present management plan has prescribed a clear zonation of the core area and the peripheral areas in which the government land forms the core area. The immediate need is to clearly demarcate the core area on the ground and start habitat improvement work there. Unfortunately, no thought has been given to this in the field.
3. A systematic mechanism has to be put in place to monitor the resident and migratory populations of birds in and around the sanctuary. The sanctuary staff should carry out fortnightly counts and record the data in registers. The data must be analysed periodically to identify trends.
4. The management of the PA needs to develop linkages with local institutes and universities to undertake studies on the local flora and fauna to develop an inventory of the PA and monitor the flora and fauna.

5. The nullah connecting the sanctuary to the local river must be desilted to allow water to reach the sanctuary so that water is available during the lean season.
6. It is important to provide detailed information online about the sanctuary through either a dedicated website for the sanctuary or the website of the Chief Wildlife Warden or the forest department to make the general public aware of the sanctuary.
7. The local people must be involved through training programmes for youth in birdwatching, etc., which will enable them to act as guides for visitors.

Evaluators
Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

34. Samaspur Bird Sanctuary, Uttar Pradesh
MEE Score- 46.66% (Fair)

Management Strengths
1. This is a large perennial water body. The flora provides an excellent habitat for both resident and migratory birds.
2. It is well connected with Rae Bareilly, the district headquarters, as well as with Lucknow.
3. The forest department has prepared a checklist of both resident and migratory birds systematically.
4. All the sanctioned posts of the sanctuary have been filled up, and there are staff quarters within the sanctuary.
5. The bird population is counted every 15 days, and the findings are noted in the register.
6. A management plan is in place. It describes the main features of the area.
7. Offences are rare and are mainly limited to illegal fishing.
8. The water body has a rich aquatic flora.
9. There is good scope for controlled bird tourism and raising conservation awareness among people, particularly students.

Management Weaknesses
1. The part of the sanctuary that is not perennially under water is honeycombed with privately owned farmlands, as a result of which there is continuous biotic interference.
2. The final notification of the sanctuary has not been issued. The rights and concessions of the people have not been extinguished. The people around the sanctuary have not been compensated. This represents a major obstacle to the effective management of the sanctuary.
3. Stakeholders such as tourists and local people do not participate in the management or preparation of Annual Plan Operation (APO).
4. The most important weakness is the erratic supply of grants for management activities, which in most cases are not time bound and need to be carried out in an holistic manner rather on a piecemeal basis.
5. The funds provided are inadequate and are not sufficient for proper management.
6. The frontline staff are not sufficiently mobile.
7. Lack of integration of good farmland practices of local stakeholders.
8. There is a lack of staff members who are trained in wildlife management, and there is no participation of the people in the management of the sanctuary.

Immediate Actionable Points

1. Funds must be released in a timely manner to the sanctuary so that the staff can carry on at least basic activities successfully.
2. It is very necessary that on the lines of Project Tiger, this sanctuary be permitted to use the fees collected from visitors to form a trust or corpus. This will reduce the dependence on the erratic supply of state and central grants.
3. The sanctuary can play an important role in providing much needed awareness about conservation. Its full potential must be used particularly to bring in more students with the involvement of nearby schools, on the lines of the Gujarat model. This will go a long way in sensitizing the people about the environment.
4. All efforts must be made to have the final notification issued, and till this is done, the affected persons or families can be given an annual compensation on the basis of the area of the land.
5. The staff of the sanctuary must be trained in wildlife management in state-owned training schools using the available trained personnel of the department.
6. The local youth may be trained in birdwatching. They in turn can act as tour guides for visitors and earn for themselves.
7. Though bird counts are carried out regularly during the migratory season, the data collected are not analysed. It is very necessary to analyse the data and bring out important information on the migratory trends of birds as well as other important information.
8. A comprehensive inventory of the aquatic flora and fauna should be prepared. Monitoring should also be carried out. Studies on carbon sequestration by aquatic plants can also be initiated in collaboration with local PG colleges and universities.

Evaluators

Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

35. Sandi Bird Sanctuary, Uttar Pradesh
MEE Score- 48.50% (Fair)

Management Strengths

1. The sanctuary is a compact wetland that is fully demarcated on the ground with an extent of 3.0854 km^2. It is well connected with the state capital, Lucknow, as well as with the district headquarters, Hardoi. There is good connectivity by both rail and road.
2. The sanctuary lies on the migratory pathway of migratory birds, and so the bird diversity is good.
3. Though it was notified as a sanctuary in 1990, it was a well-known hunting place of Britishers during the pre-independence period. It is close to the Garra river, and the river water can be used during the dry season with the support of district officials.
4. The management plan of the sanctuary is in place.
5. A total of 195 bird's species have been reported from here, including certain globally threatened species such as the Sarus Crane, Ferruginous Pochard, Oriental Darter, Black-necked Stork and Black-headed Ibis. It is one of the Important Bird Areas of the country.
6. A field guide with photographs is available for visitors. The guide is easy to read, and it describes birds, other animals and plants of the sanctuary.
7. All the sanctioned posts of the staff have been filled. Other stakeholders, particularly the local people, are not dependent on the sanctuary. Therefore, there are very few offences, and these are limited to illegal fishing.
8. Bird counts are carried out fortnightly, and the data are recorded.

9. The sanctuary has a reasonably good and well maintained interpretation centre.

Management Weaknesses

1. There are no trained staff members in the sanctuary. This is evident in the daily activities and a lack of monitoring of the available data.
2. There is a need to provide better infrastructure. One of the watchtowers is very dilapidated, and it should be dismantled.
3. The staff have no means of transportation and require vehicles for patrolling and management.
4. The release of financial grants is very irregular, and this has a direct bearing on the management of the sanctuary.
5. There is very limited or no interaction with other stakeholders, including the local population.
6. While this sanctuary should act as an epicenter of conservation awareness, involving schools and the local populace, but no such effort has been made.

Immediate Actionable Points

1. Since the wetland is surrounded by croplands on all sides, it is important to educate the local people about organic farming. A minimal use of chemicals and fertilizers should be encouraged.
2. The local staff should organize conservation camps for school children of the area on a regular basis, discussing the importance of wetlands, birds, biodiversity, etc. Sandi should act as the epicentre of conservation education.
3. Regular and timely allocation of funds is absolutely necessary for the smooth functioning of the sanctuary.
4. The local youth must be encouraged to take up bird watching and other activities related to wetland conservation with the assistance of some NGOs. This will go a long way in getting support for the sanctuary. Further, trained youth can act as guides for visitors, earning some money in the process.
5. The forest department should encourage and facilitate research studies for monitoring different aspects of the wetland. These may be initiated immediately through local science colleges and universities in which postgraduate students have to complete dissertations. They can undertake smaller topics related to the sanctuary, including monitoring of birds, other animals and plants.
6. The sanctuary needs more visibility. A website must be developed for the sanctuary. It must provide all the information possible, and one must be able to reserve accommodation in the rest house through the site.

<u>Evaluators</u>

Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

36. Suhelwa Wildlife Sanctuary, Uttar Pradesh
MEE Score- 41.66% (Fair)

Management Strengths

1. Suhelwa Wildlife Sanctuary has a typical terai vegetation, with an area of about 452 km^2 and a buffer area with an extent of about 230 km^2. It is a green strip of about 5 km width along the Indo-Nepal border. The quality of the forest is very good except in the fringes, where degraded areas have been developed due to immense biotic pressure.

2. This is a well demarcated protected area, spreading over three districts, namely Shrawasti, Balrampur and Gonda districts. The rich biodiversity is representative of the terai vegetation. Natural Sal forests are intermixed with Teak plantation.
3. Twelve small and large wetlands are spread across the sanctuary, providing ideal habitats for both resident and migratory birds. The potential of Suhelva as a bird area is unlimited.
4. There is good infrastructure available in the division in the form of forest rest houses, staff quarters, etc. The forest rest houses in the area can be used to develop nature tourism in the area. Good forest trails can be developed.
5. The sanctuary is well connected with the district headquarters of Balrampur.
6. The bird population of the area is very good. There are good vulture colonies in the area.
7. The area has very good potential to support diverse species of wildlife.
8. The management plan broadly describes strategies to take all the stakeholders together in developing the sanctuary into an excellent PA.

Management Weaknesses

1. Presently the most important weakness is a lack of staff in the PA. Against 119 sanctioned posts, there are only 69 personnel in place in the PA.
2. The area is under great biotic pressure, particularly on the Indian side where the PA boundary touches village boundaries. Uncontrolled grazing, illegal fuel wood collection and illicit felling are the main threats faced by the PA.
3. While the PA is managed according to the management plan, the buffer area is managed according to a working plan, as a result of which there is a dichotomy in management.
4. The availability of funds is very poor. The release of these funds is delayed, creating further problems.
5. Certain water bodies are with the irrigation department, and the resultant dual control affects the management negatively.
6. The mobility of the staff is poor because the vehicles are old and need to be replaced immediately.
7. None of the staff members are trained or oriented to wildlife management.
8. There is no cooperation from the local populace. Such cooperation is necessary for better management of the area.
9. There is very low visibility of the PA on the tourism map. No Eco development activities were observed.

Immediate Actionable Points

1. The first step is to develop a comprehensive website for Suhelwa Sanctuary that describes all the natural features. It must also indicate the availability of accommodation and have provisions of online booking. The website must be updated regularly, with all the changes being incorporated.
2. Interaction with locals must be initiated to regulate the uncontrolled grazing and firewood collection.
3. The sanctioned posts must all be filled so that the staff contingent is complete.
4. A wildlife orientation course must be conducted for the staff so that they understand wildlife management better and are more sensitive to the needs of the wildlife.
5. Steps must be taken immediately to prepare an inventory of the flora and fauna of the area, including birds, in collaboration with local universities, institutes, etc., and the details must be posted on a website.
6. Better interaction with NGOs and involving them in management are required.
7. The wireless network that existed must be restored. This will improve the communication system greatly.

Evaluators
Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

37. Kachua (Turtle) Wildlife Sanctuary, Uttar Pradesh
MEE Score- 26.66% (Poor)

1. This sanctuary was notified in 1989. It covers all the 80 ghats of Varanasi along the banks of the Ganges, over a 7 km stretch. According to the management plan, the main objective of turtle introduction was to get rid of partly burnt dead bodies, considering that turtles are carnivorous. It was envisaged that turtles would be released in the river for this purpose. No other conservation objective has been emphasized in the management plan.
2. It is important to note that the sanctuary is one of the area's most heavily visited by tourists. Thousands of tourists have been visiting this stretch of the river every day for many decades. The introduction of any regulation in such an area is next to impossible in Uttar Pradesh. This may be seen from the fact that all restrictions and regulation of boating and other activities in this area were stopped by an order of the state government. Naturally, the next step was to de-notify the sanctuary.
3. It was informed that the National Board of Wildlife has approved the proposal of the state government to de-notify this sanctuary subject to the condition that the state will notify another area of the same extent.
4. Under such circumstances, it is futile to note the strengths, weakness and proposed immediate action with respect to this sanctuary. Even so, for the sake of record, it is not out of place to mention that no management strengths were observed during the MEE of the area. The authorities must think very judiciously before declaring any area as PA, with very clearly defined objectives for conservation. They must ensure that all necessary inputs are provided to make the area a successful PA.
5. The only positive activity observed by the team is that about 60,000 turtles have been released in the river Ganges. Turtle eggs are being collected from all along the Ganges and hatched in the hatchery established at Sarnath. Unfortunately, the survival and growth, etc. of the turtles after their release was never monitored. As of today, nobody knows how many of the released turtles survived.
6. It is really good that the sanctuary is being denotified as no conservation activity is observed.

Evaluators
Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

38. Vijay Sagar Wildlife Sanctuary, Uttar Pradesh
MEE Score- 45.83% (Fair)

Management Strengths
1. The sanctuary is a big rain-fed water body. A part of the sanctuary remains under water even during the dry season or summer.
2. Vijay Sagar is well connected by road, rail and air. It is just 65 km from Khajuraho, which has an airport, and 300 km from Kanpur.
3. It provides a good habitat for both resident and migratory birds.

4. The ruins of an old Garhi and a forest on the hilly bank of the water body on three sides make Vijay Sagar an attractive place for visitors.
5. There is a good possibility of turning Vijay Sagar into one of the best bird sanctuaries in Bundelkhand if there are adequate inputs, with imagination and planning.
6. Vijay Sagar is a potential tourist spot that is very close to the district headquarters.
7. It has a reasonably good setting and infrastructure, and so it has great potential to be developed into a tourist spot.

Management Weaknesses

1. There are no trained staff members in the field. The situation is aggravated by a large number of vacancies. There are only four personnel in the field against a sanctioned strength of 12. Those who are in place have no idea of conservation, maintenance and monitoring.
2. The most important issue affecting the PA is non-payment of compensation for the private lands that were acquired for the sanctuary. As a result of this issue, there is no cooperation from the locals, whereas their support is of utmost importance for the PA.
3. The PA gets very limited financial grants. It is surviving only on central grants. In the absence of funds that are needed, the maintenance of the inventory and assets is very poor. No future plan can be implemented.
4. The staff have not been provided uniforms for the last 5 years. No protection gear has been made available to them.
5. There is no systematic mechanism in place for monitoring the avian fauna. The staff has very little or no knowledge of birds.
6. There is only one old fiberglass boat, that needs to be replaced as it is prone to accident and loss of life any time.
7. No inventory of the biodiversity has been prepared.
8. The entry charges are very low (Rs.5 per person). This collection is deposited as revenue with the government. No guidelines are provided to visitors when they enter the PA. Most of the area around the water body is littered with trash, plastic, liquor bottles, beer cans, etc. It appears that no good practices have been inculcated.
9. No eco-development activity is being carried out.

Immediate Actionable Points

1. Trash must be removed from the parts of the sanctuary that are visited by the public. It must be ensured that cleanliness is maintained. No food or drinks should be permitted in the PA except in a designated area that must be monitored strictly. Dust bins should be placed at regular intervals in the PA, and these should be cleaned regularly.
2. The staff members should be exposed to bird watching, bird identification and wildlife conservation and provided training immediately.
3. Local youth may be initiated as birdwatchers who can act as guides for visitors.
4. There should be a display of photographs of both resident and migratory birds of the area along with information about the flora and fauna of the PA. An inventory of the flora and fauna should be prepared and provided to visitors. A small but informative interpretation centre can be planned within the existing infrastructure on the bank of the water body.
5. It is very necessary to explore the possibility of obtaining district-level funding to develop the sanctuary better. Considering how close the sanctuary is to Mahoba and its potential, funding can be obtained easily from the district plan, particularly with there being a strong emphasis on the development of Bundelkhand.
6. The entry fees must be raised, and provisions should be made to use this money for the betterment of the area on the lines of Project Tiger areas.

7. The staff must be provided uniforms with the necessary protection gear. Action should be taken to motivate the field staff by providing extra increments, etc. to improve their performance.
8. Compensation must be paid immediately to the local people for acquired lands. This must be done on a priority basis. This will be mitigating the existing conflict with local villagers.
9. Local academic institutions and universities should be involved to conduct studies, to prepare an inventory and to monitor the populations of birds and aquatic animals and plants. It must be mentioned here that in 2015, NBRI, Lucknow carried out a study of the flora, including the aquatic flora. Seasonal changes in their populations were studied over a year. This study can be a reference point for studies on the flora. Similarly, faunal studies can also be initiated with local institutions.

Evaluators
Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

UTTARAKHAND

One of the team of Northern Region carried out MEE of 2 PAs in Uttarakhand during 2018-19, namely Govind Pashu Vihar and Nandhaur Wildlife Sanctuary. While detailed report has been submitted separately in this matter, some important observations in this regard are as follows:

1. There is an urgent need to post young energetic staff in these PAs having orientation and training in wildlife conservation. It is also necessary to fill up the vacant posts at the earliest.

2. Financial grants must be released on time enabling the staff to carry out and complete planned work.

3. It is very important to develop dedicated websites of these PAs providing full information about flora, fauna, touring season, etc. enabling visitors to plan their visits. Both of these areas are having great potential for tourism. Better facilities to the visitors be planned and provided with involvement of local people popularizing eco-tourism. Proper signages are badly needed in both the pas. A comprehensive list of Do's and Dont's must be provided to all the visitors/ tourists with proper briefing to them for developing responsible tourism in these eco-fragile areas.

4. Man animal conflict cases be attended with top priority. Disbursement of compensation be done immediately without any delay.

5. There is need to place a mechanism for regular census of important species of the area.

6. A detailed inventory of both flora and fauna need to be prepared involving local institutions/ colleges. Research on relevant issues needs to be promoted and supported after developing linkages with local university/ colleges.

7. Considering the limited financial grants provided by state, there is immediate need to reploughing entry fees collected from tourists on the line of Tiger reserves by forming a trust. This amount could be used in emergency situations for the benefit of the PA.

39. Govind Wildlife Protected Area, Uttarakhand
MEE Score- 48.33% (Fair)

Management Strengths

1. Govind Wildlife Protected Area (Govind PA), in Uttarkashi District, Uttarakhand is an exquisite area nestled in the spectacular Himalaya. It is endowed with the beautiful Himalayan landscape, with snow-clad peaks, glaciers, Himalayan meadows, waterfalls, flowing rivers, dense forests, a rich wildlife and a unique cultural landscape. Considering these attributes, this area was notified a wildlife sanctuary as early as in 1955. The total area of the PA is 957.97 km². Later on, an area of 472.08 km² was notified as a national park.
2. The PA has three ranges, namely Rupin, Supin and Sankari ranges. While Rupin and Supin ranges constitute the sanctuary-cum-buffer area, Sankari Range forms the national park, with an area of 472.08 km². The entire area of Sankari Range constitutes the core area of the PA. It is perhaps the most beautiful part of the park as well. It is a feast to the eyes to watch streams, criss crossing rivers and trees with girth more than 5 m.
3. The entire area is an excellent representative of the middle and higher Himalayan ecosystem, with the elusive Snow Leopard and Musk Deer being found at the higher altitudes. The Himalayan Bear, Barking Deer, Bharal, Goral, Wild Boar and a variety of migratory and resident birds are other important representatives of the wildlife.
4. An important positive feature is the popularity of the PA among trekkers, who visit from all over the country (even foreigners visit the area) for its natural beauty. In the last 5 years, about 51,000 tourists have visited the area, providing revenue to an extent of Rs.1.29 crores.
5. All these attributes, along with an updated and elaborate management plan, are the strengths of the PA.

Management Weaknesses

1. There is an acute shortage of young staff members who are motivated and trained in wildlife management: Of a total of 93 sanctioned posts in Govind PA, only 36 have been filled, and 57 are vacant. The greatest number of vacancies is at the forest guard level (only 13 of the 41 sanctioned posts are filled). At the RFO level, only three of the nine are filled, and six are vacant. Further, most of the staff members are old, and many are at the verge of retirement. Few staff members have worked in the PA for as long as 9 years. None of them have received training in wildlife management. The staff are demoralized and disillusioned and have no interest and passion for work.
2. There are 42 villages inside the PA, of which four are in the core zone. These are totally dependent on forest resources for their day-to-day needs, including timber for housing, small timber, firewood, fodder and bamboo, causing degradation of the rich habitat. Local cattle graze in the high-altitude meadows, and Gujjar visit and camp in these meadows. All these activities are the main threats to the area, along with man-made fires, causing immense loss every year.
3. Whereas the official record shows that there are very few instances of poaching and illicit felling, however considering the large number of licensed and unlicensed firearms and the meagre staff presence, the possibility of large-scale poaching cannot be ruled out.
4. Mobility, particularly in the core area, is highly restricted due to the lack of any motorable road. Although a road has been approved and sanctioned for the area, if constructed it will assist in controlling poaching and fire but may cause other disturbance due to opening of area to tourist vehicles.
5. There is no systematic recording of the biodiversity of the area. The ZSI and BSI have carried out surveys in the area and the Wildlife Institute of India, Dehradun has carried out certain studies, but the authorities do not have any details of these studies. All such

information must be collected, updated and made available to visitors in the form of CDs, books, etc.

6. It is important to note that the state government submitted a proposal for rationalization of the boundaries of Govind PA, including shifting four villages of the core area outside the PA and that this proposal was approved in 2009 by the Ministry of Environment and Forest. But even 10 years after the approval, no action has been taken or initiated.
7. Another important issue is that of insufficient, erratic and irregular financial grants. In the past, it has caused the surrender of substantial financial grants by the authorities of the PA.

Immediate Actionable Points

1. Posting of young, energetic and trained staff members in the PA as per the sanctioned strength with a policy of rotational posting after completion of tenure.
2. Timely, regular and sufficient financial grants to PA are absolutely necessary. The available infrastructure, including accommodation and vehicles, must be maintained regularly.
3. Creation of a PA trust on the lines of Project Tiger areas using fees collected from tourists and trekkers will go a long way in supporting conservation of the area. This must also be done immediately.
4. Local universities, research institutions, etc, must be encouraged to conduct studies and documentation of the biodiversity and trends in various attributes of the PA facilitated. The management must take cognizance of such studies in day-to-day practices.
5. Information Board describing the biodiversity attributes of the area and maps of the PA need to be put up on the track followed by trekkers and visitors.
6. An interpretation centre at the entry point describing the PA, its attributes, etc, must be set up to provide information for visitors. Tourists also need to be educated about the importance and attributes of the PA through brochures, short documentaries, etc.
7. Eco-development activities need to be introduced with the involvement of local stakeholders. These may include promoting home stays and training local youth about the local biodiversity, customs, bird watching, etc. to enable them to be good and responsible guides for tourists.
8. Trash management in the core area is another important issue that has to be addressed urgently in an effective manner.

<u>Evaluators</u>
Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

40. Nandhaur Wildlife Sanctuary, Uttarakhand
MEE Score- 54.16% (Fair)

Management Strengths

1. This sanctuary is a link between Bramhadev–Shuklaphanta Reserve, of Nepal, and the western forests of Ramnagar and Tarai Central forest divisions, in Uttarakhand, therefore forming a very important wildlife corridor.
2. There is not a single human habitation inside Nandhaur WLS. This is a significant management strength as anthropogenic pressure is one of the major drivers for wildlife decline.
3. It has sufficient perennial sources of water, which is one of the most important limiting factors for conservation.

4. It has a comprehensive management plan in place, which covers all aspects of conservation.

Management Weaknesses

1. Though Nandhaur is a full-fledged sanctuary and Project tiger area, it is a part of Haldwani Forest Division for management. The sanctuary area lies in different territorial ranges. Under dual management system there is no focus on wildlife conservation. There is a need for independent dedicated management staff for the sanctuary, to carry out wildlife Conservation programme.
2. While Nandhore has exceptional natural beauty, there is no official information available about the existence of the area and its endowments. Not even a single brochure about the PA is available. There is no official website, nor is any information available for tourists.
3. The level of vacancies among the field staff is about 46%. Further, there is no wildlife-trained staff in place in the division.
4. The flow of funds is irregular, and at times grants are not received on time. This affects the maintenance of vehicles and buildings and other important activities.
5. Though there is a management plan in place, the activities prescribed in the plan are not being executed due to irregular funding.
6. There is a problem of illegal grazing and encroachment in the form of Khattas in the adjacent forest areas.

Immediate Actionable Points

1. An official website and brochures must be prepared immediately to provide information to visitors and tourists. The necessary signage must be put up at all the important points/locations in the sanctuary along with important messages.
2. An independent management unit must be created for the management of the sanctuary immediately. Considering the bird diversity of the area, a bird festival was organized in the past. This festival should be made an annual feature involving all the stakeholders. Similarly, considering the butterfly diversity the butterfly park needs to be improved and strengthened.
3. The area has great ecotourism potential and can help improve the socioeconomic status of poor locals by providing job opportunities. Training programmes must be organized for local people for nature conservation, birdwatching, etc. so that they can guide naturalists, birdwatchers, etc.
4. Action must be taken immediately to initiate inventories of the floral and faunal wealth of the protected area in collaboration with local universities, colleges, etc. These studies must be repeated after some time to understand the trends.
5. Creation of trust or foundation on the lines of Project Tiger areas must be done to provide financial stability for critical activities.

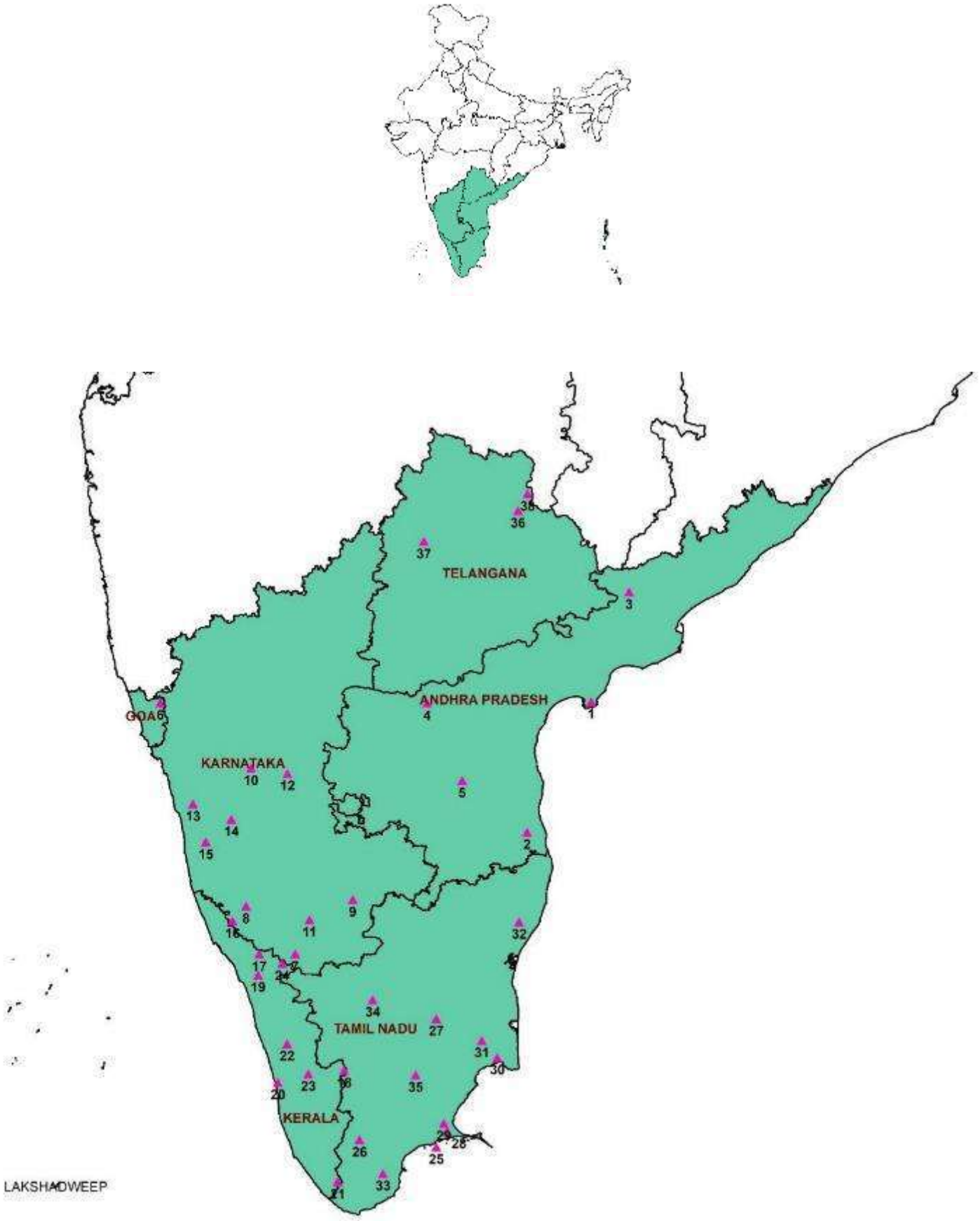
<u>Evaluators</u>

Dr. Anmol Kumar, IFS, Former DG, FSI, Dehradun
Dr. Dipankar Ghose, Director, Species and Landscapes Programme, WWF-India
Dr. Rathin Barman, Joint Director, Wildlife Trust of India, CWRC, Kaziranga
Shri Ajay Srivastav, IFS, Scientist on Deputation to WII

SOUTHERN
REGION

3.2 SOUTHERN REGION

PA ID	Name of NP&WLS	State
1	Krishna WLS	Andhra Pradesh
2	Nellapattu WLS	Andhra Pradesh
3	Papikonda NP	Andhra Pradesh
4	Rollapadu WLS	Andhra Pradesh
5	Sri Lankamalleswaram WLS	Andhra Pradesh
6	Madei WLS	Goa
7	Nugu WLS	Karnataka
8	Pushpagiri WLS	Karnataka
9	Ramadevarabetta Vulture WLS	Karnataka
10	Ranebennur (Blackbuck)WLS	Karnataka
11	Ranganathittu WLS	Karnataka
12	Rangayyanadurga WLS	Karnataka
13	Sharavathi Valley WLS	Karnataka
14	Shettihalli WLS	Karnataka
15	Someshwara WLS	Karnataka
16	Talakaveri WLS	Karnataka
17	Kottiyoor WLS	Kerala
18	kuranji	Kerala
19	Malabar	Kerala
20	Mangalavanam WLS	Kerala
21	Neyyar WLS	Kerala
22	Peechi-Vazhani WLS	Kerala
23	Thattekadu WLS	Kerala
24	Wayanad WLS	Kerala
27	Gulf of Mannar Marine NP	Tamil Nadu
28	Nellai	Tamil Nadu
29	Oussudu Lake Bird	Tamil Nadu
25	Sakkarakottai Birds Sanctuary	Tamil Nadu
26	Therthangal Birds Sanctuary	Tamil Nadu
30	Udayamarthandapuram Lake WLS	Tamil Nadu
31	Vaduvoor WLS	Tamil Nadu
32	Vedanthangal	Tamil Nadu
33	Vellanadu (Blackbuck) WLS	Tamil Nadu
34	Vellode	Tamil Nadu
35	Vettangudi	Tamil Nadu
36	Lanja Madugu Sivaram WLS	Telangana
37	Pocharam WLS	Telangana
38	Pranahita WLS	Telangana


TELANGANA
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ANDHRA PRADESH

1. A system for monitoring the status of management planning for the PAs may be set up in the Ministry with incentives and checks through the ongoing central assistance arrangements.

2. States in general may be advised to develop a system of documentation of field related information by the field staff during their field visits, and simultaneous collation of such information for building a robust information base. This can be a very useful way of assessment of the state of PA for management planning.

3. Peoples interface on PA management is overall very weak everywhere. A focused approach to encourage this would be useful in not only participatory work on conservation, but also for management of the ESZs now notified for almost all PAs.

4. Administrative arrangements of several PAs in the states of Telangana and AP need a relook. After the reorganization of the forest divisions, such PAs are distributed in more than one units and so challenges of coordination and management focusses exist. States of AP and Telangana may be advised to look into the need of a unified management command for each PA.

5. **Krishna Wildlife Sanctuary:** Located at delta of Krishna, Olive Ridley Turtle nesting grounds along the beaches endow this protected area with a special conservation value. The sanctuary is located in a very good mangrove area, and there is good potential for regeneration. Mangrove restoration programs have been undertaken by the PA management successfully.The participation of the local people seems to be weak (non-functional EDCs) despite the potential being good. Peoples interface focus has been suggested as a general issue to be pursued.

6. **Lankamalleshwara Wildlife Sanctuary:** Dedicated to the near extinct bird Jerdon's courser. A serious effort needs to be made to determine the status of Jerdon's Courser and the factors responsible for the decline of its population. This species being one of those selected for the Species Recovery Program in the IDWH scheme, Ministry may like to steer the management of this sanctuary.The area harbours an economically important endemic tree species, the Red Sanders, and this fact should be taken into account in allocating financial support for protection of the area.Peoples interface through the EDCs for participation in management and stake-based ownership seems poor. Few religious shrines within the sanctuary (Lankamalleshwara, Kailasaswami and Gopalaswami temples) causing congregate within the sanctuary, can be utilized for strengthening this interface.

7. **Nelapattu Wildlife Sanctuary:** This wildlife sanctuary is known for the migratory birds, mainly the Spot-billed Pelicans, or Grey Pelicans (*Pelecanus philippensis*) visiting for breeding during winters. This PA provides roosting and breeding sites for the birds getting \food from nearby Pulicat WLS and other wetlands in the region, thus playing a complimentary role in conservation of the biggest pelicanry of South Asia.State may be provided specific advice to maintain this sanctuary with a focus on maintaining the breeding grounds for the migratory birds in the region and also for monitoring the status of the nearby wetlands like Pulicat lake and other smaller ones in a landscape ecology approach.

8. **Papikonda National Park:** The national park forms a part of the larger forest landscape northwards. It serves not only the habitat but also a part of the protected catchment of the Indira Sagar reservoir southwards, upstream of the Polavaram irrigation project on the river Godavari. It thus has great significance as an ecosystem service source.Tourism is being used as an EDC-driven alternate livelihood activity of the local people, providing an

opportunity for a positive interface between the communities and the PA. Youth of the primitive Konda Reddy tribe are being encouraged to run the Jungle Star forest lodge. This can be cited as a case study for strengthening linkage of locals with the PA.The park needs support for an internal road network and wireless network for organizing protection work.

9. **Rollapadu Wildlife Sanctuary:** The PA is dedicated to GIB conservation. Though sighting of GIBs is not common, it was learnt that a small population visits here and Bellary, to the west, in Karnataka. Many other grassland bird species are sighted, showing that the habitat is vibrant. Recently, the area of the sanctuary has been extended.A good education and interpretation setup has been a definite strength of this WLS, which attracts local tourists including those approaching NSTR from the Andhra Pradesh side. MoEF may like to extend specific support to AP for taking up the habitat management in this WLS under the species recovery program of GIB. Better management of the habitat will be useful for the Lesser Florican and other birds also.

1. Krishna Wildlife Sanctuary, Andhra Pradesh
MEE Score- 69.17% (Good)

Management Strengths

1. The extensive Olive Ridley Turtle nesting grounds along the beaches endow this sanctuary with a special conservation value.
2. The sanctuary has pristine and well-developed mangrove area, there is good potential for regeneration due to the positive results of the mangrove restoration programmes.
3. The dependence of the local Anadi (tribal) population on the sanctuary is minimal. There is some subsistence fishing, which makes for a conservation friendly interface with the government.
4. There is growing interest among the local people in visiting the site of Hamsladeevi. Thus there will be opportunities to sensitize the visitors on environment education and conservation of awareness.

Management Weaknesses

1. The flow of freshwater into the estuaries is diminishing, resulting in increasing salinity in the estuarine ecosystem of the delta.
2. The participation of the local people is not that strong (non-functional EDCs) in-spite of the good potential.
3. There is lack of monitoring (documentation), particularly in the terrestrial part of the sanctuary due to lack of access due to lack of trekking paths and roads.
4. There is some subsistence fishing and clam collection in the area. The scale is small at present, but there is potential for these operations to be scaled up, with the demand in the market for the products increasing and a growing number of people seeking livelihoods.

Immediate Actionable Points

1. The management plan for the period 2012–22 has not been approved. It will be advisable that the plan is revisited and the species populations and habitats are reassessed and a new management plan prepared after obtaining extensive inputs from a range of stakeholders.
2. Only some anecdotal information is available about the habitats and life forms. Work on obtaining data must be planned and started immediately. An institutional system of documentation of observations by the field staff during field visits, collating the information, analysing the data and depicting the data on maps can be established. Such systems are in place in many PAs of Andhra Pradesh as well as Telangana.

3. The environment education centre being developed at Hamsladeevi can be utilised to its full potential by using innovative communication techniques for various target groups. Development of good visitor facilities along with good upkeep will help improve the interface with the people.

Evaluators
Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC
Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala
Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)
Shri Vinod D.K., IFS, Scientist on Deputation to WII

2. Nelapattu Wildlife Sanctuary, Andhra Pradesh
MEE Score- 65% (Good)

Management Strengths

1. This wildlife sanctuary is known for the migratory birds, mainly the Spot-billed Pelicans or Grey Pelicans (*Pelecanus philippensis*), that visit the area every year for breeding during the months of November and December. The Grey Pelican is the most endangered species of pelicans. Other major migratory birds visiting the sanctuary are the Open-billed Stork, Night Heron, Little Cormorant, White Ibis, Coot, Dabchick, etc.
2. The three irrigation tanks, located side by side, viz. Athigunta Tank, Nelapattu Tank and Neredugunta Tank, which are crucial for the breeding and roosting birds, can be managed to provide ideal habitats for the wintering birds besides providing irrigation facilities for the agriculture downstream.
3. The bund located along the outer eastern boundary of the PA in itself is ideal for tourism. The disturbance to the birds is minimal and the management of tourism is facilitated effectively.
4. The district and state administration, along with the local people and nature conservation groups, have a keen focus on the sanctuary and thus in protection and conservation of its wildlife values. The Flamingo Festival provides them sufficient reasons to work for the PA.

Management Weaknesses

1. Periodic droughts and variations in the water level of the tanks are the major limiting factors. It is planned to connect it to the Telugu Ganga Canal to cope with the drought and to maintain a constant water level, but the connection is yet to be made functional.
2. Grazing continues in the reserve forest. Though an extent of about 300 ha of Kalluru Reserve Forest, which is the catchment of the PA, forms a part of it, there seems to be no focus on managing it as a good catchment.
3. The opportunity of the area being source of nutrition to the agriculture downstream could not be utilized for people's participation in management while the local farming community is not inclined to cooperate.
4. Though an environment education centre is functional in the PA, a good interpretation or signage system highlighting its ecological importance is lacking.
5. Excessive numbers of visitors, mostly undisciplined people, particularly during the Flamingo Festival, cause a great disturbance and are a nuisance.

Immediate Actionable Points

1. The proposed Telugu Ganga Canal is aligned along the north-eastern side of the sanctuary. A provision is required to divert water through a connecting canal to the tanks so that whenever the monsoon fails the Telugu Ganga water can be made to flow into the tank during the birds' season i.e., between October and March.

2. Studies may be carried out regarding the availability of fish in the sanctuary, and the release of fingerlings may be optimized on the basis of the results.
3. A detailed study on the foraging behaviour of the birds in the sanctuary and other water bodies nearby is essential to understand the foraging needs of the birds. Essentially, it is important to know the ecological roles of the other wetlands and the paddy fields around them in the larger landscape in supporting the diversity and populations of bird species.
4. As there is a good flow of tourists into the sanctuary, better facilities and nature education programmes need to be developed for tourists, especially young students.
5. A cattle trap is to be provided at the entry gate to restrict the movement of cattle into the sanctuary. The chain link fence around the sanctuary is to be maintained in good condition to prevent the entry of cattle inside.
6. Attempts must be made to involve the people of the nearby villages in management planning and implementation by highlighting the significance of conservation of the bird habitat and the birds in the agricultural production in the area, in terms of the economics as well as health and well-being.
7. Artificial salt licks, as prescribed in the context of introduction of Blackbuck, should not be created in the wildlife sanctuary because artificial salt licks are not advisable in a natural protected area.
8. The staff of the PA should be provided specific training in the management and wise use of wetlands, monitoring indicators and the ecological significance thereof in the context of various land uses in the landscape.

Evaluators
Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC
Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala
Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)
Shri Vinod D.K., IFS, Scientist on Deputation to WII

3. Papikonda National Park, Andhra Pradesh
MEE Score- 60% (Good)

Management Strengths

1. The national park forms a part of the larger landscape northwards. It serves not only the habitat but also a part of the protected catchment of the Indira Sagar reservoir, upstream of the Polavaram irrigation project on the river Godavari. It thus has great significance as an ecosystem service provider.
2. This compact biological area is not fragmented nor traversed by a high-traffic public road network. Only the public road running along the northern boundary separates this park from the rest of the landscape to the north.
3. Tourism is being used as an EDC-driven alternate livelihood activity of the local people, providing an opportunity for a positive interface between the communities and the PA. Youth of the Konda Reddy tribe are being encouraged to run the Jungle Star and other EDCs for other facilities.
4. The upstream part of the Indira Sagar reservoir, being within the national park, can be utilised for environmental education and development of awareness through careful planning. People even beyond the immediate vicinity may participate in nature tourism and protection and management of the park.

Management Weaknesses

1. The park does not have a road network or wireless network that can be used for protection purposes. There is no mobile network also.

2. The administrative arrangement of the national park, with four forest divisions, is not conducive for Wild life management as it suffers from the inherent uncertainty and administrative management which may lead to confusion in the protection and management of the PA. The fact that the administrative, enforcement and management aspects are the mandates of different authorities can jeopardize the management and attainment of its objectives.
3. Twenty-six of the 47 villages inside the national park are being rehabilitated because of submergence, and three more have already been depopulated, but no action has been planned for proceeding with the acquisition of the remaining 18 villages as is required under the WLPA.
4. The park is now the catchment of the Indira Sagar reservoir. There is absolutely no setup for monitoring and collecting data on various physiographic and biodiversity aspects. This deficiency can hamper the management strategy which requires mid-course corrections towards achievement of its prime objective of maintenance of ecosystem services.

Immediate Actionable Points

1. The present management plan, for the period from 2013–14 to 2022–23, is based on the information base of 2012. In the meanwhile, the entire ecology of the Godavari valley within the park is going to be altered by the Polavaram irrigation project. With this being the case, it is the time for a thorough mid-term review of the management plan and for collection of baseline data so that a study can be carried out on the impact of damming the river and management interventions in the park can be planned. Therefore, it is strongly recommended that the management plan of the park be revisited with a fresh inventory and documentation of the data relevant for management planning with, inter alia, an additional objective of maintenance of ecosystem services since the park is the catchment of the dam.

2. The notification of the area as a national park has not been followed up with procedure for acquisition of the rights or claims in the villages inside. The process should be started immediately for the 18 villages that are not on the relocation/rehabilitation list of the Indira Sagar Project.

3. The main focus of the management so far appears to be ecotourism-related hospitality, which is a welcome aspect. However, it is urgently needed to document and understand the ecological and conservation values of the park. A road and communication network and a camera trap network are needed for this. The management of the park may set these up expeditiously.

4. The management of the PA has successfully involved the EDCs and VSSs of the region in ecotourism-related hospitality activities by providing them a sustainable and potentially growing livelihood opportunity. This involvement can be strengthened by involving them in the nature education efforts of the PA and in the management, for example the protection aspects and education interpretation, by training members as naturalist guides for the visitors and for inculcating responsible tourist behaviour.

5. The PA has started a system of collection of information related to wildlife by the forest protection staff in well-designed registers at the forest base camps. A wildlife biologist at the park also helps collate the data. The data should be further collated and analyzed so that the information can be depicted spatially. The objective is that the data should provide the basis for future management.

6. The administrative arrangements of the PA are confusing at present, after the reorganization of the territorial jurisdiction. There are three divisions despite the deployment of a wildlife DFO for the PA. A dual jurisdiction of territorial and wildlife Range Officers creates further confusion, though coordination continues at the

personal level. A unified command should be instituted by entrusting the entire responsibility of management and administration to a wildlife warden.

Evaluators
Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC
Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala
Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)
Shri Vinod D.K., IFS, Scientist on Deputation to WII

4. Rollapadu Wildlife Sanctuary, Andhra Pradesh
MEE Score- 65% (Good)

Management Strengths

1. Though sighting of Great Indian Bustard (GIB) is not common, it was learnt that a small population visits here and Bellary to the west, in Karnataka, providing hope that these birds are present. Many other grassland bird species are sighted, showing that the habitats vibrant. Recently, the area of the sanctuary has been extended.
2. A good education and interpretation centre has been established and functional in this WLS, which attracts local tourists and those approaching NSTR from the Andhra Pradesh side.
3. The local people are generally supportive of the conservation efforts, except for the Blackbuck damaging the crops. The people also expressed support for any effort aimed at resolving the situation.

Management Weaknesses

1. The WLS is an isolated grassland habitat in the middle of a landscape experiencing rapid land use changes and infrastructure development. These changes may cause erosion of the resilience of the ecosystem.
2. The GIB population seems to have been eroded beyond recovery. The possibility of sustenance of the rest of the avian populations is the need and challenge of the management.
3. The growing population of Blackbuck can cause further erosion of the interface with the people as the foraging resources within the park are also diminished by overgrazing.

Immediate Actionable Points

1. A serious effort to manage the population of the Blackbuck is needed as it is impacting not only the human interface but also the grassland ecosystem, by overgrazing.
2. Intensive work should be started on an inventory and conservation of the good bird population of the area. Better management of the habitat will be useful for the Lesser Florican and other birds also.
3. Extending the system of documentation of GIB data in the sanctuary to other important bird species by documentation of related information will be important for highlighting the significance of the biodiversity and habitat of the sanctuary.
4. Consolidation of the areas added to the habitat for management and the possibility of enhancing the extensive grasslands would be important in view of the changing land use pattern in the region.
5. A participatory programme for avian ecological conservation may be thought of with the involvement of the local people, in which nests and eggs of the birds in the sanctuary are protected and reported to the management.

Evaluators
Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC

Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala
Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)
Shri Vinod D.K., IFS, Scientist on Deputation to WII

5. Sri Lankamalleshwara Wildlife Sanctuary, Andhra Pradesh
MEE Score- 59.17% (Fair)

Management Strengths

1. Though Jerdon's Courser sightings are not common, the bird is still believed to be present here on the basis of return calls heard after playing the calls recorded previously.
2. The extension of the habitat northwards and the protection afforded by the natural features of the landscape and by the PA management, provide opportunities for the dispersal the Tiger as reported by the management.
3. The area harbours an economically important endemic tree species, the Red Sanders, and this fact provides an opportunity for seeking support for protection of the area.
4. Support is generally available from the local people for the conservation efforts of the forest department. With the Red Sanders and Jerdon's Courser being the highlights of the area, the department is equipped well to impart environmental education and develop awareness.

Management Weaknesses

1. Because there are religious shrines within the sanctuary (Lankamalleshwara, Kailasaswami and Gopalaswami temples) people congregate within the sanctuary, posing a challenge to the management.
2. The primary concern is to protect the Red Sanders from theft. Thus inputs for conservation efforts are not the top priority despite these being the main focus of the management plan.
3. The representative habitat of Jerdon's Courser—*Carissa* spp. scrub interspersed with open areas—is located on the fringes of the sanctuary. This habitat suffers from grazing and frequent human intrusion. These disturbances have impeded efforts aimed at the recovery of the focal bird species.
4. It was claimed that EDCs are involved in departmental works, but such participation in management and stake-based ownership were not observed.

Immediate Actionable Points

1. A serious effort needs to be made to determine the status of Jerdon's Courser and the factors responsible for the decline of its population. The call play back method, very effective in detecting the nocturnal birds, should be used intensively with the help of trained biologists. The possibility of effecting a recovery of the species using modern technologies such as cloning and captive breeding needs to be explored. Collaboration with expert agencies for conservation of this species is necessary. The birds have not been sighted since the 1990s. The type specimens are available in the BNHS, University of Cambridge and National Museums Liverpool.
2. Located close to the southern extension of the Nallamala forests of NSTR, Lankamalleshwara Wildlife Sanctuary harbours Tigers. It will be interesting to monitor the evolving conservation values of the area in addition to preservation of wild population of the Red Sanders.
3. The infrastructure of this PA is overall very poor. The number of protection base camps in the PA (three) and the staff strength must be augmented so that some staff

members can be deployed to monitor the values of ecological or biodiversity significance.

4. The administration of the PA needs to be streamlined to ensure that there is a single administrative and management unit rather than the two forest divisions that exist now.
5. Involvement of EDC members in park management-related deliberations, regular meetings of the EDCs with the management of the PA and monitoring of important aspects of conservation, protection of the PA, etc. should be started forthwith.
6. An education and interpretation programme is needed in view of the exceptional conservation values of the area, including the Red Sanders and Jerdon's Courser. It is recommended that a museum be set up in Kadappa with the themes including the Red Sanders and Jerdon's Courser

Evaluators
Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC
Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala
Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)
Shri Vinod D.K., IFS, Scientist on Deputation to WII

GOA

1. Madhei Wildlife Sanctuary harbours good-quality forests and is surrounded by better managed PAs of Karnataka in the east, Bhagwan Mahavir Wildlife Sanctuary and National Park in the south and forests of Maharashtra in the north. This fact makes the role of the sanctuary in providing connectivity in the larger landscape of the region significant.
2. There has been no management plan since the notification of the PA in 1999. This has resulted in a total lack of vision for the management of the PA. In the circumstances as detailed in the para above, landscape ecology should be made the basis of management approach for this as well as other PAs of the region.

6. Madhei Wildlife Sanctuary, Goa
MEE Score- 50% (Fair)

Management Strengths

1. The biodiversity rich forests of the PA are surrounded by better managed PAs of Karnataka in the east, Bhagwan Mahavir Wildlife Sanctuary and National Park in the south and forests of Maharashtra in the north. This fact underlines the significance of this sanctuary in providing larger landscape connectivity in the region.
2. Being the catchment of the river Madhei or Mahadeyi, an important tributary of the river Mandovi downstream, the significance of the sanctuary in the water regime of the state provides an opportunity to seek support for managing it intensively.
3. There is considerable potential for supporting the Tiger population of the sanctuary, which is a part of the larger Tiger landscape of Dandeli Anshi.
4. Several spectacular natural features, such as unique geology and rock formations, butterfly congregation areas and rich bird diversity provide opportunities for nature tourism development and thus provide ways of creating a flow of non-invasive benefits from the PA to the local communities.

Management Weaknesses

1. The PA is bound by a human-dominated landscape on the north-western and south-western sides, where it faces threats of encroachment, mainly for cashew plantation. As many as 30 enclosures are also located inside the sanctuary.
2. There is a very poor interface between the local people and the forest management, and there is lack of credible NGOs or social organizations. There is virtually no interaction between the PA managers and the local communities. Misconceptions about the provisions of the Forest Rights Act add to the misunderstandings.
3. There has been no scientifically formulated management plan since the notification of the PA in 1999. This has resulted in a total lack of vision for the management of the PA.
4. The near-total lack of information on the various aspects of management of the park does not help the management planning.

Immediate Actionable Points

1. A management plan must be prepared at the earliest with the participation of all stakeholders. The Goa Forest Department can identify a suitable external agency or individual to write the management plan under the supervision of the CWLW.
2. The boundary of the forest should be consolidated permanently using suitable methods such as trenches to withstand attempts at encroachment.
3. The nature tourism potential of the PA should be utilized to harvest potential economic benefits of the PA for developing an economic interface with the locals. For this purpose, basic facilities for publicity and imparting environmental education and interpretation should be developed.
4. A website should be designed and opened for the Goa North Wildlife Division that provides information on all the PAs, with ecosystem and biodiversity values, for the general public.
5. Estimates of animal numbers are not available. The entire staff should be provided training and made responsible for recording basic information about the key indicators such as wildlife sightings, evidence of wildlife crime and biotic factor encountered during the routine patrolling of the PA and surroundings.
6. More sets of camera traps should be used to gather information on the occurrence of wild animals, including rare nocturnal species.
7. Eco-development committees may be initiated to initiate a dialogue with the local people. Environmental education and awareness camps need to be organised in the fringe areas. These camps must cover, inter alia, the scope and mandate of the Forest Rights Act. For this purpose, some capable NGO that enjoys the trust of the locals may be involved.
8. NGOs and local universities may be encouraged to undertake scientific research on the various aspects of the ecology and biodiversity of the protected area. This will provide a scientific basis for improved management of the sanctuary.

<u>Evaluators</u>

Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC

Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala

Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)

Shri Vinod D.K., IFS, Scientist on Deputation to WII

KARNATAKA

One of the MEE Team of Southern Region carried out MEE of 10 NP&WLS of Karnataka. The specific comments and observations shared by MEE Chairman are discussed below:

1. Karnataka Forest Department(KFD) had performed well in having approved management plans. MEE was conducted in 9 PAs in Karnataka except Nugu WLS. KFD has approved Management Plans(MP) for all the PAs except one (Shettihalli WLS). The credit goes to the Chief Wildlife Warden for approving MP.
2. In most of the sanctuaries, wherein: MEE was conducted, a flagship species is identified such as Vulture in Ramadevara Betta, Blackbuck in Ranebennur, and Four-horned Antelope in Rangayyanadurga, which augurs well for long term conservation. Further, in Ranganthittu Bird Sanctuary a notified area of 0.67 sq.km is offset by an eco-sensitive zone of 28.04 sq.km so that nesting and breeding sites of 20 species of migratory and resident birds are efficiently conserved.
3. Another feather is that all sanctuaries are having a rating of either good or very good especially considering the fact that 2 Sanctuaries were established recently. (Ramadevara Betta WLS was established in 2012 and Rangayyanadurga Four-horned Antelope WLS was established in 2011.) Moreover, KFD has a dedicated telephone number "1926" for conflict resolution. Apart from credos, and brass tacks; KFD may consider following suggestions for guidance in implementation:

- **common suggestions across all Protected Areas(PA) wherein MEE was conducted:**
  a) *Initiation of Eco-development/ Participatory management programmes to reduce biotic pressure.*
  b) *PAs wherein MEE was conducted are predominantly sink habitats in the larger landscape, and "water" remains the focus for dependent fauna, flora and ecosystem people., Hence there is an urgent need to build water-harvesting structures and to adopt a watershed/ecosystem approach to management.*
  c) Development of comprehensive strategy towards research and monitoring, visitor management and ecotourism through a consultative process keeping in view the priority needs of the individual PA.
  d) Local scientific institutions need to be encouraged to undertake priority research according to management requirements.
  e) Filling up of frontline staff vacancies and their capacity development.
  f) The PA management seems to suffer from some delays in fund release although adequate resources are available. This delay often hampers the protection and habitat improvement tasks being undertaken.
  g) Two committees are to be constituted at state level with CWLW as chairman, one for inter departmental co-ordination (to deal with pilgrimage/ temple visitor management, release of water from dams, containing zoonotic diseases, ensuring immunization of cattle, registering arms in the surrounds of PAs etc.) and another one for granting research permission.

- **PA-wise specific:**
  a) Ranebennur Blackbuck Wildlife Sanctuary(RBWLS) is an ideal habitat of the Great Indian Bustard (*Ardeotis nigriceps*). Hence it is recommended that extracting and uprooting of stumps of Eucalyptus inside RBWLS, with approval of competent authority; so as to provide a congenial habitat for the successful recovery of the viable population of GIB.

b) Illegal grants: In RBWLS by revenue authorities inside the sanctuary have to be cancelled and encroachments if any to be evicted.

c) The boundary of Sharavati Valley Wildlife Sanctuary, have to be surveyed and demarcated and illegal grants if any cancelled and encroachments to be evicted. The actual extent of the sanctuary needs to be reconciled.

d) In remotely located Govardhanagiri Hill Range of SVWLS, at the foothills a few poor families are living (Kanoor and Urulgallu village) without any livelihood support. These families are to be voluntarily relocated and rehabilitated.

e) In respect of Ranganathittu Bird Sanctuary(RBS), The RBS management has taken actions to stabilize islands, but due to release of water by the Krishnarajasagar dam authorities, there are sudden influxes and erosion of islands. The release should be gradual and coordinated to protect the stabilisation of the banks.

f) Rangayyanadurga Four-horned Antelope Sanctuary (RWLS) was established for conserving the endangered Four-horned Antelope (Tetracerus quadricornis) along with associated animals and plants. Chowdammadevi Temple, Madrahalli and Guddaadha Anjaneya Temple are located within the sanctuary. A strategy and action plan has to be developed and implemented for pilgrim management/ visitor management.

7. Nugu Wildlife Sanctuary, Karnataka
Not Evaluated as part of Bandipur Tiger Reserve

1. The evaluation committee had conducted a field inspection of NUGU Wildlife Sanctuary (NWS) having an area of 30.32 sq. km. The back waters of NUGU Dam: which is part of NWS, had receded from the western side and the fore shore area had become vast grass land. In the grass land water melon cultivation was noticed. NWS is situated north of Bandipur National Park and is part of Bandipur Tiger Reserve (BTR).
2. The project authorities had provided us a document prepared for MEE exercise of Tiger reserve as per the approved Tiger Conservation Plan of Bandipur Tiger Reserve, where in; it was clearly indicated that NWS was assessed as part of BTR. Thus, it was evident that MEE exercise had been carried out for NWS as part of Bandipur Tiger Reserve during the year 2016 – 2017. As this sanctuary is managed as part of Tiger Reserve, the Evaluation team is of the opinion that a Management Effectiveness evaluation as part of wild life sanctuary will defeat the very purpose.

Evaluators
Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC
Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala
Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)
Shri Vinod D.K., IFS, Scientist on Deputation to WII

8. Pushpagiri Wildlife Sanctuary, Karnataka
MEE Score- 69.17% (Good)

Management Strengths

1. Pushpagiri Wildlife Sanctuary (PWLS) is situated on the north-western boundary of Kodagu District. It comprises pristine patches of evergreen forests, shola forests and grasslands. PWLS harbours a diverse flora and fauna and is part of the Serial World

Heritage Site in the Western Ghats. The third sequential management plan of PWLS has been approved.

2. The examination of documents gave an insight into the main conservation values of the sanctuary. PWLS forms part of the catchment of the rivers Lingadahole, Kumardhara, Marigundhole and Uppangalahole. PWLS derives its name from Pushpagiri Peak, the origin of the river Lingadahole. The management plan elaborates strategies aimed at protection and management of the biodiversity values of the area.
3. PWLS is linear in shape, with a perimeter of about 65 km. Three sides are relatively protected by the forests of the territorial division. MoEFCC has recently notified the eco-sensitive zone to curb potential construction and mining activities.
4. Baseline information has been incorporated systematically into the current management plan. By and large, PWLS is managed with conservation of water as the core theme, to enhance the wilderness value.
5. PWLS has well demarcated boundaries and a well-planned protection strategy. The strategy is being implemented with the support of six anti-poaching camps and two anti-depredation camps, managed by a young and energetic frontline staff. Periodic combing operations are undertaken along with the state police to curb Maoist-extremist elements.
6. The staff performance has been assessed as per the prescriptions of the management plans and the APO's plans so as to achieve the desired management objectives.

Management Weaknesses

1. The PWLS is yet to consult and involve local communities in the planning process. Further, the eco development programmes are inadequate.
2. NGOs are yet to be involved in a large scale. The contributions of local NGOs and NGIs by way of technical assistance with monitoring and with developing conservation awareness were noted by the committee.
3. PWLS faces human–wildlife conflicts due to crop depredation.
4. Research topics are decided by the institutions involved without consulting PWLS.
5. The physical infrastructure is limited. There is no interpretation centre and also facilities for visitors are minimal.

Immediate Actionable Points

1. Eco-development programmes need to be initiated immediately. It is recommended that an appropriate amount from the Coorg Conservation Foundation be earmarked for stakeholder participation, participatory planning and implementation of eco-development programmes and staff training programmes.
2. Local scientific institutions need to be encouraged to undertake priority research according to management requirements. Further, the PWLS may organise periodic meetings and seminars with the scientific community for optimal use of the first-hand information generated.
3. The physical infrastructure of PWLS needs to be augmented in terms of buildings for anti-poaching camps, an interpretation centre and facilities for visitors.
4. In recent years, the numbers of visitors, including trekkers, have increased substantially. The brochure prepared in the year 2009 projects the sanctuary as a "Trekker's Paradise in the Western Ghats". The facilities are available for visitors are limited. Visitor services and facilities need to be developed in a planned manner.
5. In recent years, numerous research programmes have been initiated in PWLS. PWLS needs to develop a research strategy in consultation with leading scientific organisations and universities based in Karnataka. On the basis of this research strategy, research studies can be permitted in this biodiverse sanctuary.

6. Systematic monitoring of RET and featured species in PWS is being carried out. Baseline information on selected species is thus available. The entire effort of monitoring needs to be strengthened, with the involvement of volunteers and the use of standard protocols. The protocols presently followed in Tiger reserves can be adopted with appropriate modifications.
7. Visitors and trekkers should be provided with optimal information. The brochure prepared in 2009 needs to be revised. A mechanism needs to be developed and adopted to obtain formal feedback from trekkers and visitors.

Evaluators

Shri Hari Kumar, Former Chief Wildlife Warden, Government of Kerala
Dr. Rajah Jayapal, Scientist, SACON, Coimbatore
Dr. P.K. Mathur, Former Dean, WII
Dr. Bitapi Sinha, Scientist-G, WII

9. Ramadevara Betta Bird Sanctuary, Karnataka
MEE Score- 63% (Good)

Management Strengths

1. Despite Ramadevara Betta Bird Sanctuary (RBVS) was established in 2012, the sanctuary has now its first approved management plan. This management plan has identified most of the conservation values, including faunal and floral attributes. RBVS has availed the expertise of Dr. Vibhu Prakash and Karnataka Vulture Conservation Trust for adopting measures to conserve the flagship vulture species. International vulture awareness day was celebrated in the Sanctuary on 1st September 2018 with the assistance of the Vulture Conservation Trust.
2. The main threats to RBVS, viz., encroachment, unregulated pilgrimage, fires and human–wildlife conflict, have been identified and documented and an action plan made to contain these threats.
3. RBVS has an established information centre. Visitor management is effectively addressed.
4. Public and NGO participation in RBVS is primarily related to awareness creation, protection and vulture conservation.
5. The local communities are primarily dependent on RBVS for grazing, NTFP (including fuel wood) and water. Owing to the effective management in RBVS, the water regime has improved and the ponds have been recharged. The dependents use the water for domestic and agricultural purposes. LPG connections have been provided to reduce the dependence on fuelwood.
6. RBVS has succeeded in reducing biotic pressure to a great extent and also succeeded in containing the increasing pressure from the large number of visitors.
7. RBVS has initiated monitoring of the Critically Endangered Long-billed Vulture (*Gyps indicus*).

Management Weakness

1. There is a lack of wildlife-trained staff members in RBVS. The frontline staff has not been given opportunity for exposure visits. A trained staff is needed to achieve the ambitious objective of vulture breeding.
2. The financial support available to initiate priority activities relevant for vulture conservation and breeding and initiating eco-development in the surrounds is meagre.

3. RBVS is an almost isolated island of wilderness in the middle of a human- and agro-dominated landscape surrounded by multiple villages. The eco-development measures are inadequate.
4. There are no facilities or amenities for managing the increasing number of visitors.

Immediate Actionable Points

1. RBVS has to manage effectively the potential threats posed by six major villages and hamlets by the intensive agriculture practised in them and by the livestock in the surrounds.
2. Trained personnel, especially a wildlife-trained RFO, are to be posted for meeting the ambitious objective of vulture breeding. Financial support is to be provided to RBVS for undertaking the prioritised activities of eco-development and vulture breeding.
3. RBVS is adjacent to the Bangalore–Mysore highway, and the number of visitors is on the increase due to the unique geo-morphological features of the sanctuary, Ramanagara Temple and the historical linkages of the site with one of the most popular and iconic Bollywood movies of the 1970s. Hence RBVS needs to gear up to address the issue of the management of increasing numbers of visitors.
4. RBVS has paid attention to the conservation of the Long-billed Vulture (*Gyps indicus*). The site is an ideal habitat for Sloth Bears *(Melursus ursinus*). There is an urgent need to undertake systematic assessments and monitoring of other elements of the flora and fauna so as to develop an appropriate management strategy.
5. RBVS has to establish linkages immediately with the local communities of the peripheral villages and involve them in park management by initiating an eco-development programme. It is recommended to have meaningful discussions with all stakeholders, including educational institutions, to create awareness and elicit support from all stakeholders (especially in the wake of the ban on the drug diclofenac, imposed in 2015).
6. The external boundaries of RBVS have been demarcated, and RBVS is free of human habitations, except for a few enclaves of encroachment. These encroachments need to be evicted on a priority basis. RBVS is a sink habitat in the larger landscape, and hence there is an urgent need to build water-harvesting structures and to adopt a watershed/eco-system approach to management.
7. RBVS is under the control of Ramanagara Forest Division, and the staff of the sanctuary consists of one Forester, one Forest Guard and two Watchers. There is an urgent need for a dedicated RFO for effective management of RBVS, and the jurisdiction of RBVS has to be brought under the administrative control of the wildlife wing.
8. RBVS needs additional resources such as camera traps, a CCTV system and adequate infrastructure, including vehicles.
9. Adventure sports such as rope climbing need to be permitted in RBVS, with provisions for insurance and self-declaration by participants.
10. There is no signage. Sufficient number of signage need to be provided for local, national and international visitors. Similarly, a formal mechanism seeking feedback from pilgrims, adventure tourists and visitors is to be put in place.
11. The final notification of the ESZ was issued in September 2017. It covers an area of 7.08 km^2. The cooperation and participation of the dependent communities in the six villages and one hamlet are necessary for successful management of the sanctuary. An action programme to win support has to be prepared and implemented in a participatory manner.

Evaluators
Shri Hari Kumar, Former Chief Wildlife Warden, Government of Kerala
Dr. Rajah Jayapal, Scientist, SACON, Coimbatore
Dr. P.K. Mathur, Former Dean, WII
Dr. Bitapi Sinha, Scientist-G, WII

10. Ranebennur Blackbuck Wildlife Sanctuary, Karnataka
MEE Score- 60% (Good)

Management Strengths

1. Ranebennur Blackbuck Wildlife Sanctuary (RBWLS) lies in the "Deccan Plateau". and harbours biodiversity rich arid flora and fauna of the "Southern Thorn Forests (6A/C1)". The average altitude of the sanctuary is 110 m. The sanctuary has a range of hillocks running north to south, with elevation up to 150 m above the plains. The key species are the Critically Endangered Great Indian Bustard (GIB, *Ardeotis nigriceps*) and Blackbuck (*Antilopecervicapra*). Thus sanctuary has the distinction of harbouring the GIB and Blackbuck, which are both well protected under Schedule I of the Wildlife (Protection) Act, 1972.The threatened Blackbuck (Schedule-I) shows a rising trend in its population. Several young fawns of Blackbuck were observed, which suggests that the population is breeding well.
2. The extent of RBWLS is 119 km², spreads over three blocks, Hunsikatti, Hullathi Alalageri and Hanumapur. with an extent of 14.87 km² in Hullathi Block notified as the core area, and the management is taking all efforts to keep the area free of biotic interference. The ground cover has predomimnantly, *Dodonaea viscosa*, *Cassia auriculata*, *Carissa carandas* and *Lantanacamara* species. There are also grasses such as *Hemata* spp., *Cenchrus* spp. and *Stylozanthus* spp. The vegetation indicates the suitability of the area for GIB. *Cenchrus* species of grass and the tender leaves of *Acacia chundra* are the main fodder of the Blackbuck.
3. Small dams and tanks have been constructed in the sanctuary as a measure of water and soil conservation. During summer the water supply is augmented through artificial waterholes, which have been constructed throughout the sanctuary which are filled with water periodically by vehicles.
4. RBWLS is free of human habitations, but is surrounded by as many as 26 villages on the periphery. The current focus of the RBWLS management is on protection. The RBWLS management has established five fully functional Anti-Poaching Camps. Basic amenities have been provided for the protection staff at each APC. Further, facilities such as solar lights and solar water pumps have been extended recently to all the APCs.
5. There are records of the past sightings of GIBs from the meticulously maintained old records (visitor book) for the period 1981–90. The RBWLS management has developed a mechanism for seeking formal feedback from visitors.
6. The Karnataka State Forest Department has created a dedicated telephone number ("1926") for receiving complaints and grievances related to the forests and the PA management.

Management Weaknesses

1. The participation of the local communities and other stakeholders in the management of RBWLS is minimal in the absence of the necessary efforts towards the establishment of EDCs and any forum for consultations with experts and line agencies.
2. Large extent of eucalyptus plantation was grown over the entire area.
3. The most important species of RBWLS, viz. the GIB, has not been sighted in the PA since 2006.

4. A major challenge to the conservation efforts in RBWLS is a lack of understanding of the distribution patterns, habitat requirements and population dynamics of the fauna and flora.
5. Not all stakeholders participate in the planning process of the preparation of the management plan.
6. There is no formal mechanism for linking the staff performance with management objectives, except routine annual confidential reports.
7. After the constitution of RBWLS, the boundaries have not been surveyed and demarcated according to the notification. Illegal grants have been identified inside the sanctuary.
8. Fragmentation of the habitat around RBWLS is leading to increasing human–wildlife conflicts. The two blocks of the sanctuary are separated by almost 15 km, and so the sanctuary has been bisected.
9. The socio-economic condition of the villagers in the surrounds is extremely backward. The bulk of the population is from the Kurumba (shepherd) and Lambani (tribal) communities, whose main occupation is cattle rearing. In the villages around the sanctuary, there are about 100,000 sheep, 16,000 goats and 30,000 cattle that depend mainly on the sanctuary for grazing. All of them use RBWLS for grazing for more than 6 months, during June–December.
10. The fodder resources are not adequate within RBWLS, and hence Blackbuck freely move out to the surrounding agricultural fields. Moving out of the sanctuary makes Blackbuck vulnerable to hunting because they are easily spotted in open agricultural fields.
11. Parts of RBWLS are still recorded as revenue pasture, patta land, etc. in the revenue records.
12. Most of the people around RBWLS depend on the forest for firewood, grazing and small timber.
13. The tourism potential of the sanctuary has not been harnessed properly. Presently, the involvement and contribution of NGOs are minimal. One or two local NGOs (CORDEA) based at Davangere render occasional technical assistance with activities related to awareness campaigns and periodic enumerations of the Blackbuck.
14. The management plan fails to document the native biological value of the area and other values such as the water catchment. Planned research and monitoring activities were conspicuously absent.

Immediate Actionable Points

1. RBWLS is one of the oldest Blackbuck sanctuaries in the dry zone of Karnataka. It consists of thorn and scrub forests and grasslands. Due to its unique large open patch, RBWLS provides congenial conditions to the Blackbuck and GIB. Eucalyptus plantations are a hindrance to the conservation of the GIB. It is recommended that (I) an open area be created by extracting and uprooting stumps of eucalyptus all across RBWLS so as to provide a congenial habitat for the successful recovery of a viable population of GIBs; (II) the GIB and Blackbuck habitat be restored by removing unwanted weeds and vegetation and habitat improvement programmes be undertaken to replenish the grasslands; and (III) farmers and villagers be given economic incentives to allow the fields to lie fallow (the loss of GIB habitat due to an increase in the area under agriculture in the surrounds of RBWLS, where fallow lands were abundant) as in the past.
2. There are many old stone quarries and crushers around the sanctuary. Hence there is an urgent need to publish the notification of the eco-sensitive zone.
3. An eco-development programme needs to be launched urgently to reduce the biotic pressure.
4. Registration of the gun license holders in a 10-km belt around RBWLS has to be done immediately as per the provisions of the Wildlife Protection Act of 1972.

5. A survey of the livestock population in the zone of influence has to be initiated to formulate a scheme for immunisation of livestock. Maintenance of records of all the livestock within 10 km from the periphery of the sanctuary is mandatory.
6. RBWLS has no wireless network, and hence a wireless network system has to be developed for effective communication and administration.
7. Baseline data on the socio-economic status of the fringe area must be collected.
8. RBWLS is located on the Hubli–Bangalore highway and has good eco-tourism potential. The facilities available in the Gangajal campus are minimal. The visitor facilities are to be improved. These, inter alia, include an information centre, publicity material, an interpretation centre and accommodation. The guesthouse needs to be modernised, and potable municipal water needs to be provided to all the facilities created at the Gangajal campus, including the staff quarters. Safari vehicles need to be purchased immediately to attract tourists for safaris in the sanctuary.
9. A building for protection, residential quarters, an inspection bungalow, an interpretation centre and APCs need to be built. Computers and GIS-RS facilities, research equipment, drones and spotting scopes are needed on a priority basis to enhance the effectiveness of the management.

Evaluators
Shri Hari Kumar, Former Chief Wildlife Warden, Government of Kerala
Dr. Rajah Jayapal, Scientist, SACON, Coimbatore
Dr. P.K. Mathur, Former Dean, WII
Dr. Bitapi Sinha, Scientist-G, WII

11. Ranganathittu Bird Sanctuary, Karnataka
MEE Score- 69.17% (Good)

Management Strengths

1. Ranganathittu Bird Sanctuary (RBS) has a notified area of 0.67 km² and an eco-sensitive zone of 28.04 km² whereby; nesting and breeding sites of 20 species of migratory and resident birds are efficiently conserved. Among these birds, the prominent species are the schedule-I (Part-III) of the Wildlife (Protection) Act, 1972 listed Eurasian Spoonbill (*Platalea leucorodia*) and Schedule-IV listed migratory species, such as the Spot-billed Pelican (*Pelicanus philippensis*), Painted Stork (*Mycteria leucocephala*) and Asian Openbill (*Anastomus oscitans*) scheduled IV listed resident species such as Large Egret (*Casmerodius albus*) and Purple Heron (*Ardeola purpurea*).
2. RBS consists of six islands and several islets. In the middle two islands, wherein regulated tourism activities are allowed, the PA management has developed sufficient infrastructure for nature education.
3. The local communities are supportive of RBS. They even provided additional land for creating tourism-related infrastructure, including an entrance gate.
4. The RBS management has involved selected scientific institutions and experts to address issues related to a high mortality of Spot-billed Pelicans (*Pelecanus philippensis*) in nearby lands.
5. RBS represents a unique riverine ecosystem in the river Cauvery with a rich avifaunal diversity. Most of the conservation values, inclusive of the floral and faunal diversity, and ecological significance have been identified and are periodically monitored.
6. The RBS management has developed ample infrastructure for nature education camps, especially for the flagship programme of the Karnataka Forest Department,

"CHINNARA VANADARSHANA", on the larger island located downstream, within Gendehosahalli village.

Management Weaknesses

1. The stakeholders' participation is limited. Specifically, the participation of the dam authorities, scientific experts, ecosystem people and ornithologists is limited.
2. The RBS management has taken actions to stabilise islands, but due to release of water by the Krishnarajasagar dam authorities, there are sudden influxes and erosion of islands. The release should be gradual and coordinated to protect the stabilisation of the banks.
3. RBS should have a full time RO, instead of the Deputy RO carrying out all the range functions. The PA generates nearly Rs.4 crores of revenue per annum from tourism-related activities. Further, the large PA–people interface exerts a pressure on the management of the PA.
4. Nearly 40% of the frontline staff positions are vacant.
5. There are no eco-development programmes. Effective participation of the community in managing visitors is lacking.
6. Generally, research efforts are deficient.
7. The biotic pressure on the islands downstream is heavy.

Immediate Actionable Points

1. RBS needs to develop a comprehensive strategy to address the livelihood issues of the resource-dependent communities, particularly those from the most deprived sections of society. This in turn will mitigate the threats due to illicit grazing and fishing, cutting of trees and collection of NTFP.
2. A planned strategy for effective community participation and eco-development in the villages adjacent to the islands downstream, especially in Arekere and in Gendehosahalli village limits, needs to be implemented.
3. There needs to be participation of the public in awareness programmes and involvement of the marginalised sections of society in visitor management activities.
4. The research needs to be strengthened. Management-related issues such as indirect problems arising on account of water pollution and similar issues need prioritised research.
5. The linkages between performance appraisal and management objectives are deficient. The RBS staff require appropriate capacity enhancement in the fields of wet land management, participatory approaches to conservation, nature education and management of aquatic fauna. Performers should be rewarded.
6. RBS is in the vicinity of prominent IT hubs (Mysore and Bangalore). RBS should make efforts to attract CSR funds.
7. There is scope for transforming Ranganathittu into a larger riverscape right from Krishnarajasagar dam to Gendehosahalli. In the riverscape, all the current dependences have to be rationalised to accommodate the conservation efforts of RBS. Adequate incentives need to built in to accommodate the dependence of the deprived sections of society.

<u>Evaluators</u>

Shri Hari Kumar, Former Chief Wildlife Warden, Government of Kerala
Dr. Rajah Jayapal, Scientist, SACON, Coimbatore
Dr. P.K. Mathur, Former Dean, WII
Dr. Bitapi Sinha, Scientist-G, WII

12. Rangayyanadurga Four-horned Antelope Wildlife Sanctuary, Karnataka
MEE Score- 61.67% (Good)

Management Strengths

1. Rangayyanadurga Four-horned Antelope Sanctuary (RWLS) was established on 10January 2011 by carving out Rangayyanadurga Sanctuary from Jigalur Range for conserving the endangered Four-horned Antelope (*Tetracerus quadricornis*) along with associated animals and plants. The forests of RWLS are typical of the Southern Peninsular Dry Deciduous and Thorny Scrub, which is rich with animals and plants.
2. RWLS is free of human settlements. The RWLS management faced resistance and antagonism from local communities at the time when the sanctuary was established in 2011. Subsequently, the situation changed remarkably due to persistent and active dialogue, interaction and outreach facilities provided by the RWLS management over the years. The staff fondly referred to the positive role played by the local MLA, NGIs such as Sanjay Guppi and Dr. Ravi Kumar and local journalist Mr. Srinivasan in the formation of the sanctuary.
3. The management plan of RWLS for the period from 2019–20 to 2028–29has been approved. Prior to this, RWLS had its first plan for the first 5 years of its existence.
4. The ESZ notification of the sanctuary was issued on 7 June 2017. The integrity of RWLS has thus been secured.
5. RWLS extends over 77 km^2 with a sanctioned strength of one RFO, one Dy. RFO, two Forest Guards and 14 Notified Watchers with no vacancy. The headquarters of the RFO are within the sanctuary itself.
6. RWLS has adopted an effective protection strategy and has created five anti-poaching patrolling camps, with an adequate patrolling staff. The PA management avails the desired co-operation from the police department to control the local masses who indulge in an annual ritual of communal hunting in connection with Ugadi festival.
7. It was observed that no major fire has been reported for the last 5 years in this highly fire-prone sanctuary.

Management Weaknesses

1. Chowdammadevi Temple, Madrahalli and Guddaadha Anjaneya Temple are located within the sanctuary. There is no pilgrim management or visitor management strategy in place.
2. Neither a comprehensive planned strategy for research and monitoring nor the infrastructure or financial resources required for research is available.
3. It was informed by the sanctuary management that the available resources are inadequate for attending to priority management activities and that resources are badly needed for creating basic and essential physical infrastructure.
4. Systematic baseline information on key faunal species is yet to be generated.
5. RWLS exists in three adjacent but disjunctive blocks with enclaves in the intervening areas.
6. RWLS has a direct interface with 23 revenue villages. In addition, there are nearly 50 villages in the surrounds. The villagers have traditionally been dependent on the forest for collection of fuelwood and livestock grazing, and they remain a major threat.
7. RWLS is yet to consult and involve local communities in the planning process. Further, the eco-development programmes are inadequate.
8. RWLS faces human–wildlife conflicts due to crop depredation.
9. The boundary is not entirely demarcated, and as a result there are marginal encroachments.

10. The physical infrastructure is limited. There is no interpretation centre. The visitor facilities are minimal.

Immediate Actionable Points

1. RWLS needs to initiate actions towards identification of stakeholders and securing their participation in the planning process. The plan has to be revised and updated by incorporating science- and evidence-based baseline information obtained through research and monitoring and through spatio-temporal analysis of various attributes in the GIS domain.
2. Eviction of marginal encroachments and boundary demarcation and consolidation
3. The eco-development programme needs to be initiated immediately. Strengthening of manpower will essentially be needed once the PA embarks upon a process of eco-development and participatory management and takes up other unattended priority activities, viz. research and monitoring, tourism management, awareness campaigns, etc.
4. The frontline staff have availed only basic foundation training in forestry. They are yet to be exposed to strategies and approaches of wildlife conservation. Participation in regular short-term courses as well as conducting specialized thematic training workshops is the need of the hour.
5. Interaction with the PA management and frontline staff and perusal of relevant documents revealed that the PA (RWLS) is more or less an island in a human-dominated landscape. There are no other PAs or forest patches or wild habitats in the surrounding landscape. Hence, it is necessary for the RWLS management to ensure by acquisition that there is connectivity between the three disjunctive blocks.
6. The physical infrastructure of the PA (vehicles, buildings, equipment, etc.) needs to be strengthened and augmented urgently. The PA does not have residential staff quarters. Because the location of the sanctuary is remote, it is essential that staff quarters be provided in a town nearby.
7. The financial support available currently from the central and state governments is just sufficient for protection and other planned activities. Additional financial resources are urgently required to attend to neglected priority activities such as boundary consolidation, research and monitoring, eco-development, development of physical management infrastructure, awareness creation, and publicity and dissemination.
8. RWLS is in its infancy and formative years. Due to its remote location, poor animal sightings, lack of tourism-related infrastructure and lack of specialised manpower, RWLS has not been able to attract tourists. Visitor facilities have to be given priority.
9. Local scientific institutions need to be encouraged to undertake priority research according to the requirements of the management, inter alia inclusive of the impacts of eco-restoration using spatio-temporal patterns and successional changes in the vegetation.
10. Further, it is recommended that RWLS organise periodic meetings and seminars with the scientific community for optimal use of the first -hand information generated.

<u>Evaluators</u>

Shri Hari Kumar, Former Chief Wildlife Warden, Government of Kerala
Dr. Rajah Jayapal, Scientist, SACON, Coimbatore
Dr. P.K. Mathur, Former Dean, WII
Dr. Bitapi Sinha, Scientist-G, WII

13. Sharavathi Valley Wildlife Sanctuary, Karnataka
MEE Score- 75.83% (Very Good)

Management Strengths

1. Sharavathi Valley Wildlife Sanctuary (SVWLS) was created on 28 June 1978 and extends over an area of 431.23 km², of which 123.63 km² is the backwater of Linganamakki Reservoir. The terrain of the sanctuary is highly undulating, with the altitude ranging from 94 m (Nagavalli) to 1102 m (Devakunda). The forests vary from Southern Tropical Wet Evergreen Forest (IA/C3) to Southern Tropical Semi-evergreen Forest (2A/C2), moist deciduous forest, shola forest and grassland. SVWLS is home to the near threatened Great Indian Hornbill (*Buceros bicornis*) and the endemic Malabar Pied Hornbill (*Anthracoceros coronatus*). It is also the home of the Lion-tailed Macaque (*Macaca silenus*). The density of the King Cobra (*Ophiophagus hannah*) is the highest in this sanctuary. It forms a part of a mega-biodiversity hotspot and qualifies to be a part of the Serial World Heritage Site in the Western Ghats.
2. The management plan is the second approved sequential plan. The plan cites most values including the featured species, evergreen and semi evergreen forests, the catchment and local native cattle breed (Malanadu Gidda). SVWLS is contiguous with Mookambika Wildlife sanctuary. On two other sides the sanctuary is contiguous to forests of Sagar and North Canara divisions. SVWLS thus merges into a larger landscape.
3. The management of SVWLS has been able to curtail human biotic interference in a significant manner by implementing an effective protection strategy and regulating livestock grazing. The Nagavalli check post in SVWLS has a CCTV facility, and all the anti-poaching camps have been renovated and provided with solar-powered water facilities, solar lights, GPS, torches and provisions for ration for the frontline staff. Most of the jungle roads are being maintained, and they are in good condition. Other infrastructure such as watchtowers and range offices are also well maintained.
4. SVWLS has involved selected local NGOs (Wild Craft, based at Shivamogga, and Bhadra Foundation) for nature education, patrolling and other priority management interventions.
5. Forest fires, livestock grazing, human–wildlife conflicts, etc. has been reduced to a great extent due to efficient administration.
6. SVWLS has an excellent wireless network system. Sufficient arms and ammunition are provided to the staff for effective wildlife protection.
7. All the anti-poaching camps have well defined patrolling routes and a patrolling-cum-movement register, with observations of wildlife sightings, etc. maintained immaculately. The mobile application ePrahari has been implemented from 1 May to ensure that patrolling is effective.
8. The range records are meticulously maintained including the range records, maps, statutory registers and all the information necessary for range administration.
9. The RTI queries are handled efficiently and responses are provided within the stipulated period. In addition, the state forest department has devised a telephone-based complaints and grievances logging system (“1926”), which is monitored at appropriate hierarchical levels.
10. Invasive species of plant are conspicuously absentfrom large parts of SVWLS, the protection and the reduction of biotic disturbance having been effective. One Deputy RFO has been assigned an exclusive task related to monitoring of legal cases and forest offences. The PA has an appropriate mechanism in place for intelligence gathering to strengthen the protection strategy.

Management Weaknesses

1. The management plan is deficient in elaborating ecological and biological values such as endemism and diversity. The settlements, encroachments and issues related to surveys and boundary demarcation are severe. The demarcation of the boundary as per the notification of the sanctuary is yet to be done. Surprisingly, there is a deficit of an area of 86.21 km². which has to be reconciled.
2. There are about 15,000 humans and 12,000 livestock within the sanctuary. Two state highways, a network of village roads and expanding agriculture, particularly cash crops, are direct threats to SVWLS.
3. The management plan has been prepared without stakeholder participation.
4. Out of the total sanctioned strength of 38 posts, nine are lying vacant, and all the vacancies are at the level of Forest guard.
5. The management plan lacks scientific insights, especially ecological relationship and holistic approach, keeping in mind the emerging needs of climate change and sustainable development. A comprehensive research and monitoring strategy is yet to be prepared. A limited number of short-term research studies, including one on the herpetofauna, have been undertaken by experts on their own initiative. The findings of even such studies were not taken into consideration at the time of revision of the management plan.
6. The proposal to relocate and rehabilitate 11 families from the core of the sanctuary (Kanoor and Urulgallu villages) is yet to be considered favourably.

Immediate Actionable Points

1. After the constitution of SVWLS, the boundaries have never been surveyed and demarcated according to the notification. Illegal grants have been identified inside the sanctuary. Hence, the immediate need is surveying and demarcation of boundaries. All the encroachments are to be evicted on a priority basis. The actual extent of the sanctuary needs to be reconciled.
2. SVWLS urgently requires a minimum of two boats to be acquired for patrolling 120 km² of backwaters in which there are hundreds of densely vegetated islands and in which illicit cutting of trees, especially valuable trees such as *Dalbergia latifolia*, takes place.
3. It was observed that in remotely located Govardhanagiri Hill Range, which is endowed with evergreen forests, at the foothills a few poor families are living (Kanoor village) without any livelihood support. These families may be relocated and rehabilitated.
4. The sanctuary supports a stable population of the Lion-tailed Macaque, the featured species of this sanctuary. In the recent past, camera traps have recorded the presence of four Tigers, which were new to the area. Sufficient funds should be allocated for undertaking the planned activities required for achieving the management goals and objectives.
5. Augmentation of resources (a 4WD vehicle, speed patrol boats, RS and GIS facility, camera traps and drones) would immensely help manage this signature sanctuary of the Western Ghats scientifically and effectively.
6. A comprehensive strategy towards research and monitoring through a consultative process, keeping in view priority management needs, must be developed as also baseline information. To obtain insights into trends in biological attributes, spatio-temporal patterns and thematic maps need to be created in the GIS domain.
7. A dialogue needs to be initiated with primary and secondary stakeholders, who need to be involved in the management of SVWLS. Local support need to be elicited, and the active involvement of local people in some of the activities, viz. habitat management,

monitoring and eco-tourism, need to be ensured through an eco-development programme.

8. The three PAs are managed by a DCF, Wildlife Division, with the support of an ACF and two Range Officers. The RFOs and other frontline staff members should get opportunity to participate in a regular certificate course in wildlife management/specialized thematic training/workshops. Exposure visits to learning centres would help the field staff greatly.
9. Eco-sensitive zone notification is urgently required to strengthen the hands of the SVWLS management.
10. Organized eco-tourism is yet to be developed in SVWLS. So far, the visitors have mainly been pilgrims visiting selected prominent temples within the PA or participants of nature education camps and a small number of adventure tourists (trekkers). The PA can optimally take advantage of the large number of visitors visiting the famous Jog Falls and pilgrims by providing opportunities for nature appreciation and awareness. A mechanism for obtaining formal feedback is to be evolved and institutionalised.
11. The sanctuary has developed a camping facility close to the backwaters (Muppane), which is being used by adventure tourists (trekkers) and students coming for nature education. Selected resource persons (birdwatchers, snake experts and naturalists) are being regularly invited for nature camps as and when required. A large number of pilgrims visit Sigandur temple. During the annual festival, the PA management takes adequate care to control the movements of the crowds and to regulate the use of plastics and garbage disposal. Continuous action is needed to ensure that SVWLS remains a plastic-free zone.

Evaluators
Shri Hari Kumar, Former Chief Wildlife Warden, Government of Kerala
Dr. Rajah Jayapal, Scientist, SACON, Coimbatore
Dr. P.K. Mathur, Former Dean, WII
Dr. Bitapi Sinha, Scientist-G, WII

14. Shettihalli Wildlife Sanctuary, Karnataka
MEE Score- 62.50% (Good)

Management Strengths

1. Shettihalli Wildlife Sanctuary (SWLS), having an extent of 395.6 km², was constituted by amalgamating 11 reserved forests, 14 minor forests and three plantations. Legally, the sanctuary came into existence on 23 November 1974. SWLS is divided into a core zone (100.6 km²), buffer zone (237.4 km²) and tourism zone (57.6 km²). The flagship species of the sanctuary is the Malabar Pied Hornbill (*Anthracoceros coronatus*). The sanctuary has a rich and diverse flora and associated fauna, the major factors contributing to this diversity, being the differences in rainfall and topography within the sanctuary. A rapid transition from an evergreen flora to the scrub type, i.e., from a mesophytic type to a xerophytic one, occurs as one moves from the west to the east. Magnificent evergreen vegetation covers a narrow belt in the Western Ghats, and it gradually merges into the moist deciduous towards the east and south. The vegetation of SWLS consists of evergreen, semi-evergreen, deciduous and moist and dry deciduous types of forest. A myriad life forms and an amazing biodiversity are the hallmarks of SWLS. The Karnataka state animal, the Asian Elephant (*Elephas maximus*), the state bird, the Indian Roller (*Coracias indica*), the state flower, the Lotus (*Nelumbo nucifera*), the state tree, the Sandalwood (*Santalum album*), and the state butterfly, the Southern Birdwing (*Troides minos*), coexist in this sanctuary.

2. The proposal to rationalise the boundary of the PA has aimed to integrate SWLS into a wider landscape by adding areas and realigning the boundary. Once the proposal is approved and implemented, SWLS will have strong connectivity with nearby Bhadra Tiger Reserve.
3. The current management plan awaits approval. Definitely, it is not comprehensive and is deficient in baseline information and insights into trends. However, the management of SWLS has carried out a comprehensive exercise to prepare a detailed proposal to rationalise the boundary of the PA. In addition, the PA management has separately prepared a fire management plan. A local NGO has occasionally participated and provided support with activities related to planning.
4. Most of the field staff are adequately trained in the use and application of basic tools and equipment used in patrolling and data collection, viz., GPS and camera traps. The staff have also received training in using e-Prahari, the app for collecting and organising information from the field during perambulations and monitoring activities.
5. It was informed that the sanctuary has adequate physical infrastructure. SWLS has GPS units, camera traps and equipment needed in wild animal rescues. The evaluation team visited one of the forest range offices in SWLS and found that it was well managed.
6. Some key management interventions towards habitat restoration were evident from waterholes that had been constructed, from soil and water conservation measures and, more importantly, from protection of habitats against encroachments.
7. The SWLS management regularly avails the services of one NGI from Shivamogga—a non-professional conservationist—in matters related to the PA and nature education (such as the Chinnara Vana Darshana programme).
8. Though the PA suffers from a shortage of frontline staff members to manage routine field activities, the staff are generally well motivated and committed even amidst growing challenges emanating from the large human settlement–forest interface that the PA is currently going through. One Range Forest Officer has been nominated to receive the Chief Minister's Meritorious Award for the year 2017–18.
9. The SWLS management has a two-pronged complaints redressal system, involving the RTI act and a dedicated phone line ("1926") to receive, log and monitor grievances and suggestions from the public. The PA management informed the evaluation team that very few queries and complaints were received last year and that all these were disposed of in a timely manner
10. SWLS has taken some preliminary initiatives to create awareness about the sanctuary through pamphlets in the local language and through road signage.
11. Notwithstanding financial constraints, the SWLS management has undertaken regular and periodical maintenance of its assets, particularly the buildings. All the APCs in SWLS have been recently revamped with tiled floors, solar-powered lamps and pumps, RCC roofs and LPG connections.
12. SWLS, owing to its extensive PA–people interface and the resultant pressure on its natural resources, faces several challenges in effecting protection and preservation. However, the SWLS management has recently undertaken several proactive measures, which have resulted in a remarkable reduction in incidences of fire and poaching. Recognising the issue of the presence of 32 human settlements and 70 villages inside the sanctuary, the SWLS management has rightly taken up rationalisation of the PA boundaries so as to exclude as many villages as possible.
13. The PA management claims to have the full support of one forest village (viz., Shettihalli) for all their activities and measures. The PA management does not face any significant antagonism from other communities (even if it does not enjoy their active support). The current boundary rationalisation exercise has also gained the support and good will of several villages within the sanctuary and of the local political leadership.

Management Weaknesses

1. During 1960–65, the creation of Linganamakki reservoir led to the submersion of many villages. The people affected by this hydro-electric project were shifted and allowed to settle at Shettihalli. SWLS even now is a lesser known sanctuary in the central Western Ghats. This is unfortunate as SWLS has significant biodiversity value despite the huge pressures from human populations.
2. SWLS has 32 enclosures and 70 villages inside the sanctuary. The size of the revenue enclosures varies from a few households to 110 households. 95% of the people are dependent on agriculture.
3. SWLS has a curious villus shape, with several subsections separated by village enclaves and settlements. SWLS has an extensive, porous interface and extraordinarily long external and internal boundaries.
4. SWLS faces some serious problems; the pending survey and demarcation of boundaries, difficulties in affording protection, remote locations of villages and enclaves, encroachments, dependence on traditional resources, a high pressure of livestock grazing, forest fires and extensive old monoculture plantations of species exotic to the area.
5. A large extent of the PA's understorey is dominated by *Lantana camara*.
6. The notification of the ESZ is pending.
7. There was a long gap of 4 years between the first plan and the current draft plan. As stated earlier, the draft plan is conspicuously devoid of the much desired baseline information on ecological and biological attributes and socio-economic indicators.
8. The evaluation team was informed that nearly 50% of the sanctioned strength in the field staff of SWLS remains vacant. It was also learnt that the staff transfer rate was high. In fact, the PA had four different DCFs in the last 2 years.
9. The PA management, owing to the severe shortage of field staff members, often resorts to improvised task allotment as and when required, and this may hamper effective functioning in the long run.
10. It was informed that the sanctuary suffers from occasional delays in fund release and consequent lapses of funds.
11. There is no systematic and regular participation of the local communities in the SWLS management.
12. Despite Shettihalli WLS being a biodiverse area, very few research studies have been conducted in the PA on wildlife ecology and management. In fact, SWLS woefully lacks baseline data on its major biodiversity components and habitat.
13. SWLS is surrounded by densely populated human settlements and some village enclaves that naturally give rise to an increased level of human–wildlife conflicts.
14. PA does not have an elaborate tourism infrastructure and as such, very little could be learned about whether visitor expectations are met. The PA management claims that visitor booksare available with all the Forest rest houses, but these are seldom used by tourists.

Immediate Actionable Points

1. Systematic planning, concerted efforts and monitoring are urgently required to restore habitats invaded by invasive species.
2. Though there are no baseline data from which to infer general trends in the populationsof key animal species, wild Elephants and Tigers are known to occasionally visit the PA from the nearby Bhadra TR, and their increasing presence points to better protection of the habitats in recent times. However, the SWLS management should consult reputed organisations to develop a population monitoring protocol for the major animal species and to train the field staff in population estimation techniques. It

is strongly urged that the SWLS management proactively ensure the presence of well-meaning and bonafide NGOs.

3. SWLS has to develop a comprehensive strategy towards research and monitoring through a consultative process, keeping in view the priority management needs of the area.
4. SWLS is currently managed by four forest ranges and the frontline staff. A large number of APCs have been established at strategic locations and refurbished. The PA requires additional APCs in some of the unattended areas to strengthen the protection measures.
5. Additional resources are to be provided to SWLS for initiating activities related to eco-development, research and monitoring, documentation and dissemination of information, publication of publicity material, etc.
6. SWLS has put up some signage for visitors. However, SWLS needs to prepare brochures, create a website, set up an interpretation centre and collect information for dissemination.
7. Local support needs to be elicited and enrolled for some of the activities, viz. habitat management, monitoring and ecotourism.
8. The SWLS management has, in recent times, taken some initiatives to address some of the livelihood issues of the resource-dependent communities living in or close to the sanctuary. These include supplying free smokeless stoves and LPG connections, which will considerably reduce the pressure on the forests for fuelwood and lessen the burden on the women in the local communities and improve their health. However, these initiatives are extensions of the efforts of the state government's line departments, and SWLS should evolve and implement innovative schemes.
9. Currently, SWLS has very limited tourism, and the elephant camp on the banks of the river Tunga, adjacent to the sanctuary, is the main tourism attraction. As such, visitor facilities are not well developed. The SWLS management must prepare a good and viable eco-tourism plan.

Evaluators
Shri Hari Kumar, Former Chief Wildlife Warden, Government of Kerala
Dr. Rajah Jayapal, Scientist, SACON, Coimbatore
Dr. P.K. Mathur, Former Dean, WII
Dr. Bitapi Sinha, Scientist-G, WII

15. Someshwara Wildlife Sanctuary, Karnataka
MEE Score- 80% (Very Good)

Management Strengths

1. Someshwara Wildlife Sanctuary is a small (c. 314.25 km^2) but important and contiguous landscape under the Kudremukh Wildlife Division. It was established in 1974 and was primarily created for protecting low-elevation evergreen and semi-evergreen forests, which are rich in plants and animals unique to the rainforest ecosystem. The sanctuary has the King Cobra (*Ophiophagus hannah*) and Lion-tailed Macaque (*Macaca silenus*) as its featured species, and these occur here in good numbers.
2. The current management plan (2015–25) of SWLS is the fourth in the series and it has rightfully identified the ecological, biological and heritage values of SWLS. The plan has recognised the importance of SWLS as the catchment area for several rivers, notably the Seethanadi, Varahi and Swarna. The management plan is well written and captures all the essential ingredients.

3. This sanctuary is one among the 39 serial World Heritage Sites in the Western Ghats, identified for their exceptional biodiversity.
4. A weekly sanitation drive is conducted to clear all the garbage along the Shimoga–Mangalore highway, which passes through the sanctuary.
5. The incidences of forest fire are monitored through both intelligences from beats and through real-time forest fire detection maps provided by space agencies.
6. The sanctuary faces several challenges and pressures from human settlement enclaves inside the sanctuary and an extensive human–PA interface. However, the management has taken visible steps in the past to wean the local communities' resource-dependence to a large extent, as evident from the moderate livestock load inside the sanctuary.
7. The sanctuary management has identified and demarcated the core and buffer zones in their plan and map. They have also trekking routes, visitor road circuits and a rafting stretch along the river Seethanadi for tourism activities.
8. Periodical measures are undertaken to improve the water storage and recharge of ground water in selected beats of the sanctuary.
9. The sanctuary has protection as its uppermost priority, which is evident from the establishment of eight fully functional and well-staffed APCs throughout the sanctuary. Each APC has 7–9 foot patrolling routes, along which beat guards and APWs perambulate regularly and monitor the forests. They have a patrolling diary to record all the observations. The patrolling teams have GPS, binoculars and other equipment to record and observe animal sightings and other significant observations. In addition, night patrolling (*kalabhairava*) is also undertaken periodically along selected routes to detect any illegal activity.
10. The sanctuary management is amply aware of the importance of the sanctuary as a corridor in the larger Kudremukh–Sharavathi landscape, comprising four PAs. The current plan underscores the landscape linkages that the PA has with other PAs and the significance of the PA in sustaining the populations of species such as the Tiger and Elephant. All the three PAs (including Someshwara) are managed by the Kudremukh Wildlife Division, therefore there is coordination in management initiatives that will have implications across the division. It was informed that meetings are regularly conducted with other line departments including the revenue, police and health departments.
11. Most of the field staff are well trained in the use of modern tools and their applications in PA management. They have received hands-on training in the use of GPS, camera traps and the e-Prahari app, which has been developed by the Karnataka Forest Department for online recording and reporting of observations by beat guards during their perambulations.
12. The PA has adequate infrastructure in place, including fully furnished and renovated APC camps, field equipment such as GPS and camera traps, and 4WD vehicles. The sanctuary has procured two drones recently for use in field monitoring.
13. It was observed that the field staff are particularly motivated and committed to the protection and management of the PA. Though the staff has not received an awards, the sanctuary manager gave testimony to their commitment and efficiency in protecting the fragile PA.
14. One of the main reasons for the PA management's success in reducing the threat perceptions of the sanctuary is the efficient and timely resolution of human–wildlife conflict. Crop damage and livestock predation are the predominant conflicts in the PA, and the management has an effective and transparent compensation scheme and delivery system in place that have garnered the trust and goodwill of the local communities. According to the records for the period of 2015–19, a total sum of about

Rs.7 lakhs was granted to local communities as crop damage compensation and a sum of about Rs.9 lakhs towards livestock kills by wild predators.

15. It was informed to the committee that seven EDCs were created and two are still active, with an annual credit turnover of over Rs.2 lakhs. In addition, the PA regularly involves volunteers from local communities for fire control operations and for gathering intelligence inputs regarding illegal or suspicious activities inside.
16. The PA management has in place both an RTI-based response system and a dedicated telephone line ("1926") to receive, log in and monitor forest-related grievances and complaints. Both the mechanisms ensure that complaints are redressed in a time-bound manner. In addition, the PA management also complies with the Sakala scheme of the state government, the Karnataka Guarantee of Services to Citizens (KGSC), which enforces the right to services of any citizen.
17. This is one of the better-known PAs of the central Western Ghats, with quite a few researchers, trekkers, and tourists visiting it. There was adequate signage along the highway, proclaiming the territory of the PA and general do's and don'ts for visitors and road users. Though the PA does not have an exclusive website, but the Karnataka Tourism Development Board has on its website, given adequate information about the PA and its facilities.
18. Though the sanctuary has over 30 inhabited village enclaves and an extensive human–forest interface, the management of the sanctuary has undertaken several measures to keep the threats emanating from these settlements under check.

Management Weaknesses

1. In the last two decades, a few research studies have been undertaken in the sanctuary, mostly on the population status and distribution of the featured species
2. The management plan update process involves few contributions from external stakeholders such as researchers, conservationists and local communities.
3. Currently, the PA has a shortage of frontline staff members owing to recent transfers and vacancies that are expected to be filled in another couple of months.
4. The PA management seems to suffer from some delays in fund release although adequate resources are available. This delay often hampers the protection and habitat improvement tasks being undertaken.
5. The sanctuary does not have any major contributions from conservation NGOs though a few organisations occasionally conduct wildlife surveys and nature education activities.
6. The sanctuary management has informed the committee that funds are often inadequate or delayed, affecting the maintenance schedule of the management. It was observed that some of the APCs need to be renovated as has been done in neighbouring PAs (viz., Sharavathi Valley WLS and Shettihalli WLS).
7. The PA does not have a systematic population estimation process of its own in place.

Immediate Actionable Points

1. The Kerala Forest Department may urgently take up the ESZ notification with MoEFCC.
2. The PA management has to develop a comprehensive strategy towards research and monitoring through a consultative process, keeping in view the priority management needs of the area.
3. Additional resources are to be provided to the PA for initiating activities related to eco-development, research and monitoring, documentation and dissemination of information, publication of publicity material, etc.

4. The sanctuary has the potential to enhance eco-tourism so as to garner support from the people for conservation and to create awareness, which is badly required, about the strong linkages between the forest and water. Local support need to be elicited, and it needs to be ensured that there is active involvement of the local people in some of the activities, viz. habitat management, monitoring, and eco-tourism.
5. The sanctuary has received very few visitors/tourists (apart from the clientele of JLR's Seethanadi Nature Camp). But going by the experience and popularity of Seethanadi Nature Camp, it is perhaps true that most visitors would have their expectations satisfied during their visit to SWLS. However, SWLS should develop its tourism infrastructure and interpretation centre to make the eco-tourism successful and sustainable.
6. The PA management claims that a few village enclaves inside the PA are quite supportive of the management and that their voluntary services are often availed by the administration in controlling forest fires and gathering intelligence inputs. Currently, about 80 households from the enclaves have come forward voluntarily to accept the PA management's relocation and rehabilitation package—a sign of their positive attitude towards the sanctuary.
7. The PA management recognises the need for removal of exotic plantations to improve the habitats, but a comprehensive plan in this direction is to be prepared urgently.
8. Though the PA planning is generally comprehensive and addresses all key issues of management, there is little stakeholder participation in the process. It is strongly recommended that the PA evolve formal institutionalized mechanisms to involve local communities, researchers, conservationists and other line departments in the planning process. One notable association is the one between SWLS and Agumbe Rain Forest Research Station (ARRS), run by Madras Crocodile Bank Trust, which conducts research on the King Cobra, the featured species of the PA, and monitors its population.

Evaluators
Shri Hari Kumar, Former Chief Wildlife Warden, Government of Kerala
Dr. Rajah Jayapal, Scientist, SACON, Coimbatore
Dr. P.K. Mathur, Former Dean, WII
Dr. Bitapi Sinha, Scientist-G, WII

16. Talacauvery Wildlife Sanctuary, Karnataka
MEE Score- 69.17% (Good)

Management Strengths

1. Talacauvery WLS (TWLS) is part of the sequential World Heritage Site of the Western Ghats, and it plays a crucial role as an Elephant corridor in the Mysore Elephant Reserve. TWLS integrates the reserve into a larger ecological landscape. Threats to TWLS have been identified and assessed. TWLS is fortunate to have a forest buffer around its 54 km periphery out of its total 64 km extent. A larger extent of least disturbed evergreen, semi evergreen and shola forest are significant in maintaining the ecosystem services of the sanctuary. The final notification of TWLS was issued in 1994. Presently TWLS has its third approved sequential plan for the period from 2018–19 to 2027–28. Appropriate efforts have also been made in the plan to highlight the linkages of the sanctuary in the larger landscape perspective with various sectors and surrounding areas.
2. Sincere efforts made towards affording comprehensive and effective protection were evident by the way boundaries have been demarcated and anti-poaching camps

established, with an adequate and passionate frontline staff. Eco-tourism activities are permitted in the form of adventure trekking, which is well regulated.

3. TWLS has succeeded in minimising the human–Elephant conflict by addressing the issue effectively and by creating awareness.
4. The present DCF has spent a considerable part of his career in managing the sanctuary, serving in different capacities. Further, the Range Forest Officer in charge of TWLS is wildlife trained and the members of the frontline staff are qualified and have undergone basic forestry training.

Management Weaknesses

1. Few stakeholders participate in the process of preparing the management plan.
2. TWLS is yet to initiate a dialogue with the local communities of the peripheral area (10 km), with Kerala for inter-state coordination regarding the 4 km border stretch and with other prominent line agencies, viz. Talacauvery Temple, the tourism sector, PWD and the highways department, for holistic management.
3. TWLS has some vacancies among the frontline staff. Moreover, the focus of the present staff is on protection works and habitat management. Some of the neglected aspects, viz. the PA–people interface and rapidly growing tourism activities will require the staff to be strengthened.
4. TWLS has six enclave grants. There are peripheral villages around a small stretch of nearly 10 km (the total length of the periphery is 64 km). This stretch includes a revenue area contiguous with the forest area under the Madekeri Forest Division and a 4 km stretch bordering the adjacent state of Kerala. The potential threats to the TWLS have not been addressed.
5. The involvement of NGOs and support provided by them to the PA management are minimal.
6. An updated brochure, website and interpretation facilities are lacking.

Immediate Actionable Points

1. TWLS has to develop a comprehensive strategy towards research and monitoring through a consultative process, keeping in view the priority management needs of the area.
2. Additional resources need to be provided to TWLS for initiating activities related to eco-development, research and monitoring, documentation and dissemination of information, publication of publicity material, etc.
3. The scope for eliciting support through CSR funds (tea and coffee estates and hoteliers) is to be explored.
4. TWLS has put up some signage for visitors. However, TWLS requires to update its brochure, create a website, set up an interpretation centre and develop material for disseminating information.
5. TWLS needs to carefully examine and analyse the field data collected so far so as to obtain insights into the status of RET species.
6. TWLS attracts small numbers of adventure trekkers. TWLS's contribution to the visitors is mainly in the form of regulation and provision of essential support. There is potential to enhance eco-tourism in TWLS so as to garner support from people for conservation and to create awareness, which is badly needed, about the strong linkages between forests and water.
7. Local support needs to be elicited and the active involvement of local people in some of the activities, viz. habitat management, monitoring and eco-tourism need to be ensured.

Evaluators
Shri Hari Kumar, Former Chief Wildlife Warden, Government of Kerala
Dr. Rajah Jayapal, Scientist, SACON, Coimbatore
Dr. P.K. Mathur, Former Dean, WII
Dr. Bitapi Sinha, Scientist-G, WII

KERALA

General Observations on Management Effectiveness Evaluation of National Parks and Wildlife Sanctuaries of Kerala 2018-19

Eight protected areas namely 1. Malabar Wildlife Sanctuary, 2. Mangalavanam Bird Sanctuary, 3. Neyyar Wildlife Sanctuary, 4. Pecchi- Vazhani Wildlife Sanctuary, 5. Thattekad Bird Sanctuary, 6. Wayanad Wildlife Sanctuary, 7. Kattiyoor Wildlife Sanctuary and 8. Kurunjimala Wildlife Sanctuary were evaluated for Management Effectiveness during the year 2019-19 by the MoEFCC formed evaluation team. The overall performance of management effectiveness of these protected areas ranged from good (six PAs) to very good (one PA) category with the exception of one urban protected area i.e. Mangalavanam bird sanctuary which is very small in size(2.74ha) even for a bird sanctuary and surrounded by concrete structures, which bordered on a category of being fair. Three protected areas were in the large size class category being larger than 300sq km in size, two were in medium size class category (between 100 to 200 sq km) and three were in small size class category being less than 100 sq km in size. However, all protected areas had significant habitat, floral and faunal values being located in the Southern Western Ghats Bio-geographic Zone.

One of the significant values of the PAs were their contiguity with the larger interstate transboundary habitat landscape and this is a creditable step of planning location and setting up of the PA network in Kerala. For example, the Neyyar WLS is contiguous with Kalakad-Mundanthurai Tiger Reserve of Tamil Nadu, the Wayanad WLS is contiguous with Bandipur and Nagarhole WLS in Karnataka and Mudumalai in Tamil Nadu. The Malabar WLS is contiguous with Nilgiri Biosphere Reserve in Westen Ghats, Kurunjimala WLS is contiguous with Anamalai Tiger Reserve and Chinnar WLS of Tamil Nadu and Kottiyoor WLS is contiguous with Brahmagiri WLS of Karnataka. These linkages and contiguity provides an opportunity of wildlife migration and gene flow amongst populations in different states. One notable feature in these PAs of Kerala is existence of Management Plans with no breakage and adhoc management through Annual Plan Operations.

The other notable feature in management of PAs in Kerala were linkages established with professional research organisations and institutions for research, documentation and monitoring of important flora and fauna as well as well-developed and organised Eco Development Committees in all protected areas for community participation and eliciting support in management. Combined with this is the systematic and well organised Nature education camps in well-appointed education and interpretation centres that also caters well for tourism management.

Presence and absence of human settlements and livestock was a mixed bag with a few PAS with no human settlements at all (e.g. Neyyar) and some with such large human settlement (e.g. Wayanad) that the management spends all their time in activities related to sorting their problems as well as weed and invasive species management related with livestock proliferation. Associated problems such as fire, grazing, invasive species, monoculture

plantations were some of the overarching problems that the PA management in Kerala needs to focus to sort out if their management has to move from good to very good category.

Rationalising boundaries of some of the Protected Areas such as Kottiyoor and Aralam WLS is a requirement, so that instead of being two small PAs with separate management regime they can become a single, compact and modest sized landscape under better and unified management regime.

What was also noticed as a weakest management point was the focus on skill development of the PA management staff. There is a need for an enhanced focus on development of capable and skilled human resource such as providing adequate wildlife management professional training to most, if not all protected area staff in the state, which seems to be a major drawback as observed during the MEE of the eight PAs in Kerala during 2018-19. The overall readiness to accept technological innovations such as open source geospatial tools for management is welcome.

17. Kottiyoor Wildlife Sanctuary, Kerala
MEE Score- 67.50% (Good)

Management Strengths

1. This is a compact PA connected to the adjacent Aralam Wildlife Sanctuary and Wayanad North Forest Division of Kerala, and Brahmagiri Wildlife Sanctuary of Karnataka.
2. The Kottiyoor Wildlife Sanctuary is rich in biodiversity. There is a high level of endemicity in the PA with a number of endemic species of mammals, particularly primates.
3. Most of the values have been systematically identified and documented. These values are being monitored.
4. The PA has no human or biotic interference.
5. The site has a well written and comprehensive management plan that is regularly being updated.
6. Habitat restoration and habitat protection plans are in place and are monitored in a timely manner.

Management Weaknesses

1. Although Aralam Wildlife Sanctuary is contiguous with Kottiyoor, the management plan makes only limited attempts to integrate the two.
2. The PA does not have frontline staff trained in wildlife management and monitoring techniques.
3. The PA has not made any attempt to integrate NGOs and other professional institutions into management complementarities.
4. The visitor facilities and amenities are inadequate even though the PA is small.

Immediate Actionable Points

1. Attempts must be made to train the top-level and frontline staff of the PA in wildlife management and monitoring.
2. The mismatch between the allocated funds and expenditure needs to be rationalized.
3. The PA management should try to develop a proper education, interpretation and outreach sub-plan, with adequate supportive infrastructure.
4. A proper mechanism needs to be developed for evaluating the population dynamics of key wildlife species.
5. It is strongly recommended that the sanctuary and the network of PAs connected to it be brought under a single Landscape Management Plan as a holistic conservation approach.

Evaluators
Shri P. Anur Reddy, Former PCCF, Government of Karnataka
Dr. S. Narendra Prasad, Former Faculty, SACON, Hyderabad
Shri B.C. Choudhury, Former Faculty, WII
Dr. Abhijit Das, Scientist-D, WII

18. Kurinjimala Wildlife Sanctuary, Kerala
MEE Score- 61.67% (Good)

Management Strengths

1. The sanctuary is well known for its endemic and flagship species assemblages. The PA is rich in biodiversity.
2. The PA is ecologically connected to other larger PAs such as Anamudi Shola National Park, Anamalai Tiger Reserve and Chinnar Wildlife Sanctuary in the landscape.
3. The first comprehensive management plan of the park is in place, and most values of the PA have been documented well.
4. There are two anti-poaching camps within the PA. The forest department works in collaboration with other line government agencies to safeguard the biodiversity of the park.
5. Annual Plans of Operation (APOs) are in place. The release of funds for management is reported to be on time.

Management Weaknesses

1. The park biodiversity faces threats from monoculture plantations, invasive species and grazing issues.
2. The habitat restoration plans are not adequate. Most restoration plans are currently made on ad hoc basis.
3. The remote location of the park, with limited vehicle and road access, hinders patrolling, particularly during the monsoon.

Immediate Actionable Points

1. Livestock grazing and the spread of invasive species must be controlled on a priority basis.
2. The staff of the forest department need to be trained in wildlife management and monitoring techniques.
3. Funds need to be allocated for construction of roads to improve access to, and within, the PA.
4. Monitoring of populations of endemic and RET species needs to be initiated.

Evaluators
Shri P. Anur Reddy, Former PCCF, Government of Karnataka
Dr. S. Narendra Prasad, Former Faculty, SACON, Hyderabad
Shri B.C. Choudhury, Former Faculty, WII
Dr. Abhijit Das, Scientist-D, WII

19. Malabar Wildlife Sanctuary, Kerala
MEE Score- 66% (Good)

Management Strengths

1. Malabar Wildlife Sanctuary is one of the PAs of northern Kerala with rich biodiversity. It also forms part of Nilgiri Biosphere Reserve (NBR) and Wayanad Elephant Reserve.
2. The management plan documents angiosperms, pteridophytes and bryophytes available in the area. As many as 680 species of plants are enumerated.
3. In addition, extensive checklists of mammals, birds, butterflies, reptiles and fishes are provided.
4. Endemic bird species of the Western Ghats such as the Kerala laughing thrush, Wayanad laughing thrush, Nilgiri pipit, white-bellied blue flycatcher, grey-headed laughing thrush, Nilgiri wood pigeon and Indian rufous babbler occur in the sanctuary.
5. One of the strengths of the sanctuary is that there are no human settlements inside the PA.
6. More than 350 Vana Samarakshana Samithy (VSS) persons are employed in eco-tourism activities.

Management Weaknesses

1. Human–wildlife conflicts, especially crop depredation by elephants, are a cause of concern.
2. Information on animal and plant distribution is inadequate.
3. There is a need to manage invasive plant and fish species within the sanctuary.
4. There is lack of sufficient manpower and patrolling stations for adequate protection and monitoring activities.
5. Future threats include a proposed road from Poozhithode to Padinjarathara.

Immediate Actionable Points

1. The staff need to be trained in wildlife management.
2. New boats are required for the protection staff.
3. Anti-poaching camps need to be established.
4. Some priority funding is required, and periodic monitoring of the wildlife and habitat needs to be initiated.
5. Ecotourism initiatives need to be initiated in a careful manner.
6. Crucial elephant corridors need to be identified as conservation reserves/ community reserves.

Evaluators
Shri P. Anur Reddy, Former PCCF, Government of Karnataka
Dr. S. Narendra Prasad, Former Faculty, SACON, Hyderabad
Shri B.C. Choudhury, Former Faculty, WII
Dr. Abhijit Das, Scientist-D, WII

20.Mangalavanam Wildlife Sanctuary, Kerala
MEE Score- 56.25% (Fair)

Management Strengths

1. This is a unique land-locked mangrove habitat in the heart of Ernakulam City. This wetland has an area of 2.74 ha and was declared a bird sanctuary in 2004. It is an ecologically fragile area, consistent with its not being part of a larger conservation landscape.

2. Mangalavanam is an oasis of green in a concrete jungle.
3. A committee, headed by a retired High Court judge, oversees the management activities and the legal issues arising from activities of developers around the sanctuary.
4. There is support from the people for conservation. They visit regularly and help prevent any encroachments.
5. Mangalavanam plays an important role in the hydrology of the urban landscape.

Management Weaknesses

1. Uncontrolled discharge of sewage into the mangrove wetland.
2. Exotic tree species in the sanctuary are hindering nesting and feeding of the bird population.
3. Construction around the sanctuary, vehicular traffic, parking and noise are continuous uncontrolled threats.

Immediate Actionable Points

1. A sewage treatment plant is urgently required to be installed for treatment of sewage and polluted water entering the sanctuary.
2. Desilting of the sanctuary must be carried out at the earliest as the water-holding capacity of the wetland is decreasing. This will have a great impact on the birdlife in the sanctuary.
3. Exotic tree species need to be removed in a phased manner. Local species such as *Acacia nilotica* can be planted. This will help nesting of the birds.
4. Ticketing must be introduced. Some paths need to be re-laid, or laid out, without disturbing the birds.
5. Scientists and local NGOs, with expertise in wetland and bird ecology, need to be members of the management committee so that scientifically valid management decisions are taken.

Evaluators
Shri P. Anur Reddy, Former PCCF, Government of Karnataka
Dr. S. Narendra Prasad, Former Faculty, SACON, Hyderabad
Shri B.C. Choudhury, Former Faculty, WII
Dr. Abhijit Das, Scientist-D, WII

21. Neyyar Wildlife Sanctuary, Kerala
MEE Score- 72.50% (Good)

Management Strengths

1. Neyyar Wildlife Sanctuary (WLS) has well defined natural boundaries. The sanctuary is more or less contiguous with a vast stretch of Reserve Forests in Kerala and Tamil Nadu. The sanctuary is connected to the adjacent Peppara Wildlife Sanctuary, Kerala, and the Kalakkad–Mundanthurai Tiger Reserve, Tamil Nadu. This permits free movement of wildlife within the landscape. The outer boundaries of the sanctuary are well demarcated, intact and well protected.
2. The floral and faunal diversity has been well documented. Endemic species of the Western Ghats such as the Lion-Tailed macaque, Nilgiri langur and Nilgiri tahr are found in the sanctuary. Research conducted by some scientists has revealed that Neyyar WLS houses a healthy and strong Nilgiri tahr population. This is believed to be the single largest population of the Nilgiri tahr in Kerala after Eravikulam National Park.
3. The park has had a continuous management plan. There is no encroachment, and the wildlife connectivity is intact.

4. Because Neyyar WLS is close to Thiruvananthapuram, it attracts large numbers of visitors, including young students. The visitors are targeted by a well-organized outreach and awareness programme.
5. There are active EDC groups participating in intelligence-gathering activities, poaching control and control of illicit felling. Women participate actively in conservation efforts.

Management Weaknesses

1. Livestock grazing within the sanctuary is a major problem for the authorities. People living on the fringes and tribal people living inside keep a large number of cattle. They set the animals loose in the forests for grazing. This not only reduces the fodder supply of the wild herbivores but can also sometime lead to outbreaks of diseases such as foot and mouth disease and anthrax.
2. The ex-situ facilities for the Asiatic Lion and spotted deer, and the unplanned crocodile rehabilitation programmes, conducted within the PA are out of place, in terms of conservation value and utility for wildlife management.
3. Fire is one of the serious problems faced by the sanctuary during the dry season. Poachers, smugglers, tribals, local people and pilgrims are primarily responsible for the incidence of fires in the sanctuary. It appears that fire management has not received adequate attention it deserves.
4. The present staff have not received any training in wildlife management and the use of advanced field equipment (camera traps, GPS, range finders, night vision equipment, etc.). The availability of binoculars, GPS, camera traps, etc. is inadequate, and if these are provided to all members of the field staff, field data can be maintained more regularly, with proper documentation. The lack of trained staff members seriously affects the management programmes of the sanctuary.

Immediate Actionable Points

1. Since Neyyar WLS is a well-protected PA, with significant biodiversity values in terms of endemism, an action plan needs to be drawn up to accommodate key faunal and floral species of the sanctuary.
2. Upgrading the skills of the staff of the PA, through training programmes in wildlife management conducted by external, as well as in-house experts, should be emphasized.
3. A greater involvement of NGOs in census, research, awareness and extension work is recommended.
4. Although the outreach and awareness programmes, involving nature camps, are a good initiative, a well-planned interpretation centre will go a long way in addressing the requirements of the large numbers of visitors.
5. Research activities are almost non-existent, and applied research projects relevant to the PA need to be carried out by reputed institutions and individuals.
6. The Asiatic Lion (a dry deciduous forest habitat specialist) Safari is completely out of place in the moist deciduous and evergreen habitats of the PA. The presence of Lions gives a totally wrong message, especially to the younger generation. The Lion Safari may be discontinued, and the facility can be converted into a large-herbivore (Gaur) Safari.
7. The necessity and purpose of a spotted deer breeding centre in the PA, in terms of wildlife management requirements, should be the subject to introspection and review.

<u>Evaluators</u>
Shri P. Anur Reddy, Former PCCF, Government of Karnataka
Dr. S. Narendra Prasad, Former Faculty, SACON, Hyderabad
Shri B.C. Choudhury, Former Faculty, WII
Dr. Abhijit Das, Scientist-D, WII

22. Peechi-Vazhani Wildlife Sanctuary, Kerala
MEE Score- 69.17% (Good)

Management Strengths

1. The Peechi-Vazhai Wildlife Sanctuary (WLS) has a large area and is representative of the south Indian moist deciduous forests. It is connected to the Chimmony Wildlife Sanctuary at the southern boundary, and to the Parambikulam, Thrissur and Vazhachal forests, and is a part of the Anamudi Elephant Reserve, Kerala.
2. The forests of the sanctuary provide ecosystem services in terms of micro-climatic effects and exert favourable influences on the soil and water conservation regimes of the adjacent inhabited and agricultural lands.
3. Peechi-Vazhani WLS is home to almost all the major mammals of peninsular India. So far, 48 species of mammal belonging to 22 families have been recorded. The sanctuary is also home to a significant variety of birds, reptiles and amphibians.
4. The sanctuary has a science-based management plan prepared through a participatory process, with expert consultations and workshops and a series of micro-plans.
5. Wildlife censuses are conducted regularly, and a wildlife monitoring system is in place.
6. Committees constituted at the section level, including local people, ward members and EDC members, participate in the fire management and control programmes.

Management Weaknesses

1. Lack of control on poaching, grazing, unsustainable NTFP collection and use of pesticides by inhabitants of the fringe areas of the WLS.
2. Lack of management of disturbances from visitors to the WLS and from settlements in the fringe areas, close to the dam sites.
3. The unique habitats of the PA and the distribution of RET species in the sanctuary have not been identified.
4. The distribution of anti-poaching camps is not effective, and the members of the staff are inadequately trained, or untrained, in wildlife monitoring.
5. Inadequate infrastructure, including staff quarters, patrolling vehicle and boats.

Immediate Actionable Points

1. Adequate planning is required for monitoring, management and patrolling of areas vulnerable to human and biotic interference in the PA.
2. There must be more interaction and coordination with the Peechi-Vazhani dam authorities as the reservoir within the PA has been leased out.
3. Rationalized planning and location of anti-poaching camps is needed to make the protection regime more pragmatic.
4. Immediate action needs to be taken to ensure that the staff strength meets the requirement of the PA.
5. Capacity-building and training of PA staff should be taken up immediately.
6. More staff quarters, boats and vehicles are required immediately for patrolling.
7. Regulated trekking on forest trails can be introduced, in a limited way, to supplement the limited tourism that exists on the reservoir.
8. Since elephants have returned to the sanctuary, a more intense and constant monitoring of their movements is needed.

<u>Evaluators</u>
Shri P. Anur Reddy, Former PCCF, Government of Karnataka
Dr. S. Narendra Prasad, Former Faculty, SACON, Hyderabad

Shri B.C. Choudhury, Former Faculty, WII
Dr. Abhijit Das, Scientist-D, WII

23. Thattekkad Bird Sanctuary, Kerala
MEE Score- 77.50% (Very Good)

Management Strengths

1. Thattekkad Bird Sanctuary has well defined natural boundaries. The biodiversity values have been well-documented. At present a total number of 234 bird species have been recorded in the sanctuary.
2. Thattekkad is located in the foothills of the Western Ghats. It is surrounded by the Malayattoor, Sholayar and Parambikulam hill ranges, on one side, and Munnar, Eravikulam and Chinnar, on the other side. The PA is a part of Anamudi Elephant Reserve.
3. Though Thattekkad is a bird sanctuary, the habitat mosaic also supports a large number of mammalian, reptilian, amphibian and fish species, including several endemics.
4. This PA is one of the best known sanctuaries of Kerala. It is visited by a large number of ornithologists. Therefore, the management focus, interpretation, education and awareness activities are bird-centric.
5. The tourism management initiatives are well organized and supported by infrastructure and, attended and unattended, interpretation facilities.

Management Weaknesses

1. Of the total extent of 25 km² of the PA, almost 9 km² is under human habitations. This is a major issue in the management of the sanctuary. The PA appears to be an ecological island.
2. The habitat is threatened by plantations, grazing, collection of fuelwood and invasive species.
3. Human–wildlife conflict, especially involving wild boar and wild birds, creates negative feelings among the local villagers.
4. The tourism pressure is high and sometimes disturbs sensitive species such as the Ceylon frogmouth.
5. There is considerable tourism infrastructure, such as home stays, within the landscape of the PA.

Immediate Actionable Points

1. Rationalization of the boundaries and inclusion of private lands in the sanctuary need to be reviewed.
2. Adequate mechanisms need to be established to: (1) monitor rare, endangered and threatened species and, (2) monitor special habitats and unique species.
3. Coordination with scientific institutions is required for long-term conservation benefits.
4. Human–wildlife conflicts should be reduced through appropriate mitigation measures and incentives.
5. The staff strength needs to be enhanced to meet the increasing tourism-related work.
6. Ensure adequate seasonal availability of water in aquatic habitats for the benefit of wetland-dependent wildlife.
7. Interactive displays need to be installed at the interpretation centres.
8. Technically and scientifically sound anti-poaching, patrolling and perambulation activities need to be implemented and linked with the GPS-based tracking system.

9. The possibility of obtaining funding support from the corporate sector through CSR budgets needs to be explored as bird sanctuaries are very popular in the corporate sector.

Evaluators
Shri P. Anur Reddy, Former PCCF, Government of Karnataka
Dr. S. Narendra Prasad, Former Faculty, SACON, Hyderabad
Shri B.C. Choudhury, Former Faculty, WII
Dr. Abhijit Das, Scientist-D, WII

24. Wayanad Wildlife Sanctuary, Kerala
MEE Score- 66.60% (Good)

Management Strengths

1. The area of the sanctuary is large and it represents an ecological continuum of the Nilgiri Biosphere Reserve, which represents the larger Western Ghats conservation landscape and biogeographic zone that is home to several species of endemic fauna and flora. This also has continuity with Bandipur and Nagarhole tiger reserves of Karnataka and Mudumalai tiger reserve of Tamil Nadu. (can be incorporated after talking to Chairman)
2. The sanctuary is rich in biodiversity, and has a number of endemic species. It also harbours one of the largest population of wild Elephants.
3. The sanctuary has a good prey base of animals, such as gaur and sambar, that supports a viable tiger population.

Management Weaknesses

1. The sanctuary is fragmented by human-dominated landscapes.
2. There are several tribal communities living in and around the sanctuary.
3. The presence of considerable domestic cattle and humans leads to human-wildlife conflicts.
4. There is a problem of spread of invasive species like Senna spectabilis. This is really impacting the habitat. (Chairman need to be informed before adding this line.)

Immediate Actionable Points

1. An effective management programme needs to be put in place to remove human settlements from the sanctuary. A long-term plan to resettle the 67 settlements of the sanctuary needs to be drafted and implementation schedules need to be put in place.
2. A weed management action plan is to be put in place. In particular, controlling the spread of *Senna spectabilis* is to be given priority.
3. The Chedaleth range of south Wayanad needs to be integrated with the sanctuary to provide a secure elephant corridor.
4. The functioning of EDCs needs to be strengthened. Only five out of 16 EDCs are doing well.
5. Encroachment on forest lands, and man-animal conflicts, require priority action.

Evaluators
Shri P. Anur Reddy, Former PCCF, Government of Karnataka
Dr. S. Narendra Prasad, Former Faculty, SACON, Hyderabad
Shri B.C. Choudhury, Former Faculty, WII
Dr. Abhijit Das, Scientist-D, WII

TAMIL NADU

Eleven Protected Areas including National Parks and Wildlife Sanctuaries were entrusted to the team for MEE in Tamil Nadu during the year 2018-19. Among these eight were bird sanctuaries covering water tanks in inland areas of the state. Nallai Wildlife Sanctuary, Gulf on Mannar National Park and Vallanadu black buck sanctuary were the only three PAs, which are not the bird sanctuaries. Although detailed actionable points are brought out in respect of all 11 PAs, but some of the important and common issues are listed below;

1. Gulf of Mannar is prone to severe anthropogenic pressures from the communities in the vicinity. More than three lakh fishermen catch fish for their living and are totally dependent on this Biosphere reserve. They use nearly 5000 mechanized trawlers and 25000 traditional boats. They also sometimes use dynamite and damage coral reef, which otherwise provide refuse to some varieties of fishes and protect them from predators like big fishes. In the process of damaging coral reefs, the habitat is lost. Illegal collection and trade of highly endangered marine organisms like sponges, sea cucumbers, sea turtles, fishes and scheduled sea shells are prevalent. Sewage also drains into the gulf. Solid waste disposal locations are along the shore and the contents do get washed away into gulf. Stray incidences of poaching for dugong, dolphin and turtle are reported even after strict enforcement.

2. The management plan of Nallai Wildlife Sanctuary was referred to Chief Wildlife Warden for approval, which made certain observations. DFO Tirunelveli has attended the observations and returned it. Now Chief Wildlife warden has to expedite the approval of the Management plan. Fund is required for building maintenance as well as for construction of new buildings especially for the housing of the staff in the interior areas.

3. The Oussudu Sanctuary is a part of a larger aquatic habitat of about 800 Ha of which 490 Ha had been declared as a sanctuary by the Government of Puducherry and 331.78.5 Ha was notified by the Government of Tamil Nadu as a bird sanctuary in 2015. Considering the Oussudu lake as a continuous one, there should be just one Management Plan for the lake irrespective of state boundary (Pondicherry or Tamil Nadu). This should also take the tanks in the surrounding areas into consideration.

4. Management Plan of Vallanadu blackbuck Sanctuary is yet not finalized. It should be attended immediately and approved. The management actions should be prioritised and taken up based on the severity of threats. The completion of fencing, removal of the explosives, removal of cattle etc. should be the sequence. The proposed eco-sensitive zone is to be notified and management must connect with villagers and promote some of their income generating activities.

5. There is shortage of manpower in all bird sanctuaries. Wildlife trained personnel, researchers and some protection staff may be necessary. Right of way in some of the bird sanctuaries is not settled. It may require urgent attention.

6. Prosopis has invaded many of these bird Sanctuaries area. Even human landscape is also dominated by Prosopis. Some patches of the sanctuaries may require its removal.

25. Gulf of Mannar National Park, Tamil Nadu
MEE Score- 79.17% (Very Good)

Management Strengths

1. The Gulf of Mannar had drawn the attention of conservationists even before the initiation of the Biosphere Programme of UNESCO in 1971. In 1986, an area of 560 km², covering 21 uninhabited islands surrounded by coral reefs, was declared a National Park. In 1989, the entire marine space between Rameshwaram and Kanyakumari, with an area of 10,500 km², was declared the Gulf of Mannar Biosphere Reserve, the first marine biosphere reserve of India.
2. About 3600 marine organisms are found here, which include 147 species of sea weeds, 12 species of sea grasses, 13 species of mangroves, 200 species of sponges, 100 species of echinoderms, 260 species of molluscs, 90 species of crustaceans, 450 species of fish, five species of sea turtles, 14 species of dolphins, six species of whales and the dugong (sea cow), which is a symbol of the Gulf of Mannar.
3. The Gulf of Mannar was important even in the 2nd century AD because of its highly productive pearl oyster banks and religious significance. There are over 4223 species of plants and animals occupying varied ecosystems such as coral reefs, rocky shores, sandy beaches, mud flats, estuaries, mangroves, sea weed stretches and sea grass beds.
4. The declaration of the area as National Park was due to the significance of the Gulf of Mannar, where there are 21 islands, mostly of coral origin, which are very significant from the zoological point of view. This area is the last refuge of one of the most endangered mammals of India, the dugong (*Dugong dugon*), and it contains the rare and unique acorn worm *Balanoglossus,* which is a link between invertebrates and vertebrates. The area is also very richly endowed with unique coral formations, marine shells, molluscs and tropical fish associated with coral islands. Dolphins are also seen in this area.

Management Weaknesses

1. The Gulf of Mannar is prone to severe anthropogenic pressures from the communities in the vicinity. More than 3 lakh fishermen catch fish for their living and are totally dependent on this biosphere reserve. They use nearly 5000 mechanized trawlers and 25,000 traditional boats. Sometimes, they also use dynamite and damage coral reefs. These reefs provide refuge and protection from predators to some varieties of fish. Thus, dynamiting leads to habitat loss.
2. Illegal collection of, and trade in, highly endangered marine organisms such as sponges, sea cucumbers, sea turtles, fish and scheduled sea shells are prevalent. Sewage drains into the gulf. Solid waste disposal locations are located along the shore, and the contents of these get washed away into the gulf.
3. Stray incidences of poaching of dugongs, dolphins and turtles are reported, even though there is strict enforcement of anti-poaching laws.
4. Seaweeds, which grow on dead corals, are collected by fisher folks, mostly women, damaging the dead corals and also affecting the live ones.
5. Mollusc shell collection through skin diving is also a threat to the area.
6. Coral were collected earlier for construction and as raw material for the lime industry. According to an estimate, three decades of coral mining activity, up to 2005, resulted in the loss of an extent of about 32 km² of reef. The efforts of the park authorities have started showing results as there was an increase in live coral cover from 37% in 2005 to 43% in 2009. Coral mining has now been stopped. However, the management has to remain alert.
7. During the visit around some of the 21 islands of the national park, it was found that different stretches of coral reefs were dead. Some of the live coral can be seen beneath

the water using a snorkeling kit, and they are in many colors, often presenting a view of a flower garden. In 2016 it was reported that colourful coral started bleaching and losing their original colour. This is on account of a rise in temperature. The loss of colour is an indication of death. It was also observed that in small patches coral were gaining colour and reviving.

8. Coral reefs check the intensity of storms and cyclones originating from the sea. They also provide cover for fish, especially when they are young. Climate change leads to the death of coral, which in turn can aggravate the intensity of storms and can also impact the lives of the fishermen.
9. A number of industries like thermal power plants (TTPS), heavy water plants (HWP) and chemical industries, and a chain of salt pans in the southern part of the Gulf of Mannar region pose a threat in the form of pollution from untreated sewage. The northern region of the Gulf of Mannar particularly suffers from domestic sewage let out directly into the sea.
10. The park authorities perceive the proposed Sethusamudram project as a threat.

Immediate Actionable Points

1. During field visit our team came across a scientist from the National Centre for Coastal Research, Ministry of Earth Sciences, Government of India. The field station of this research centre was established in 2018, following the death of coral due to global warming in 2016. This scientist is engaged in monitoring the health of coral, GIS mapping, identifying degraded coral areas, studying the impact of sedimentation, etc. The centre has established four hatchery units on 20 ha. of land in Mandapam for preparing seedlings of fishes, lobsters and prawns. This is being done to enhance live stocks to address the livelihood issues of fishermen.
2. The center is also taking up the task of regeneration of coral in the wild. Live coral are secured to cement slabs, tied together with iron mesh, 2 m below the low tide level. Iron does not get rusted in brackish water, and the structure remains intact and the corals regenerate.
3. To control illegal acts, the forest department has established nine anti-poaching camps on different islands. They are equipped with CCTV cameras for monitoring by senior officers. The department is also engaged in planting *Thespesia, Lannea coromandelica, Pongamia, Azadirachta indica* and palm trees on the islands for overall habitat improvement.
4. All above initiatives (1-3) need to be continued and further strengthened.

Evaluators
Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

26. Nellai Wildlife Sanctuary Tirunelveli, Tamil Nadu

MEE Score- 72.50% (Good)

Management Strengths

1. This sanctuary is a very important part of the wider ecological network and provides a corridor between two important Tiger reserves, namely Kalakad Mundanthurai Tiger Reserve (KMTR) and Periyar Tiger Reserve (PTR)), and protected areas at Srivilliputtur

and Meghamalai. Further, there are some more sanctuaries and important territorial divisions for conservation of wildlife on the Kerala side, bordering this sanctuary.

2. The heavily populated villages on the eastern side of this sanctuary get the benefit of numerous streams and rivers originating from it. There are 27 rivers and streams that originate in the sanctuary and run through it. Due to the erratic nature of the monsoon and reduced vegetation density in the middle and lower regions of the watershed, most of these rivers go dry and experience flash floods alternately. None of these rivers reaches the Bay of Bengal. They end up in numerous tanks in the plains, and the water is utilised for agriculture in Tirunelveli and Thoothukudi districts.
3. The public are important stakeholders, and the 26 Village Forest Committees (VFCs) on the eastern border of the sanctuary are supportive of the management. They generally help avert illegal activities, forest fires, etc.
4. There are patches of forest on steep slopes in the sanctuary. These patches are not easily accessible except on foot. This is a geographical advantage of the area and it helps to protect the forests.

Management Weaknesses

1. There are 12 estates in and around the sanctuary. These are spread over all the ranges (except Sankarankoil Range) and exert anthropogenic pressure on the habitat.
2. There is greater pressure of humans and cattle on the eastern fringes of the sanctuary, as the 125 km long stretch is exposed to a number of villages.
3. There are 12 anti-poaching camps without suitable camping facilities and buildings. Some culverts and bridges are also to be constructed for easy access by staff on foot.

Immediate Actionable Points

1. The management plan was referred to the Chief Wildlife Warden for approval, who made certain observations. The DFO Tirunelveli has attended to the observations and returned the plan. Now the Chief Wildlife Warden has to expedite the approval of the management plan.
2. Funds are required for maintenance of old buildings, as well as construction of new ones, especially for housing for staff members in the interior of the sanctuary.
3. The second instalment of central funds has been held up for want of utilisation certificates (UCs) from one or two divisions. MoEFCC should have a system in place for releasing the second instalment duly, withholding it only for the divisions from where the UCs are not received.
4. As this is a recently notified sanctuary, we have to upgrade the anti-poaching camps and introduce smart patrolling system using GPS.
5. Four tigers were captured by camera traps in the sanctuary, and National Tiger Conservation Authority (NTCA) is now willing to provide funds for activities related to conservation in the sanctuary. This should be pursued.
6. Solar pumps are being installed to provide water to many water holes where the impounded water goes dry during summer. Yet, there are still some water holes where oil pumps have been installed. The management must ensure that all the oil pumps are changed to solar pumps in a phased manner.

<u>Evaluators</u>
Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

27. Oussudu Lake Bird Sanctuary, Tamil Nadu

MEE Score- 45.83% (Fair)

Management Strengths

1. The lake has a long history, starting from 1234 AD. It was the source of irrigation for nine villages. It has a total spread area of 700 ha and a catchment area of 410 ha. It is one of the significant wetlands in Asia according to the Asian Wetland Bureau. The area is also recognized as a wetland of national importance under the National Wetland Conservation Programme of MoEFCC and as an Important Bird Area (IBA) by Birdlife International.
2. The sanctuary is a part of a larger aquatic habitat of about 800 ha, of which 390 ha was declared a sanctuary by the Government of Puducherry and 331.78.5 ha was notified by the Government of Tamil Nadu as a bird sanctuary in 2015.
3. The people around Oussudu are dependent on the lake for various purposes. The lake plays a major role in recharging and maintaining ground water. There is potential for the sanctuary to become a recreational location because of the bird life and its aesthetic beauty, especially for city dwellers.
4. The sanctuary harbours about 480 species of plants, nearly 25 species of fish, 14 species of mammals (including the spotted deer, jackal, mongoose, black-naped hare, pangolin and porcupine), 63 species of butterflies and 166 species of birds. Of the birds, 75 are aquatic forms, including the Darter, Spot-billed Pelican, Great White Pelican, Painted Stork, Spoonbill, Flamingos and Cormorants.

Management Weaknesses

1. The sanctuary is in the middle of an urban environment. Its boundary has not been demarcated on the ground, which leads to unauthorized entry. Because of the location, eutrophication is expected. The area has problems of illegal fishing, solid waste dumping and sewage draining. Though poaching of birds in the sanctuary has not been reported, the surrounding areas are prone to poaching.
2. Weeds and invasive species, especially *Prosopis juliflora* and *Ipomea,* cover the sanctuary to a great extent. The African catfish in the lake is a threat to the native fishes. The lake is surrounded by a network of roads on which there is heavy movement of vehicles. The lake is also subjected to environmental pollution.
3. There is no properly planned eco-development programme or, public participation, in the management. Though the sanctuary has procured a few pairs of binoculars and a spotting scope, there are no visitors, mainly because of a lack of infrastructure and manpower. There are no trained guides, watchtowers or, an interpretation centre. There is no trained officer or biologist engaged in coordinating various activities related to research, monitoring, awareness programmes and eco-development activities.
4. Though bird counts are carried out, there is no systematic analysis or monitoring. No research programmes are in place. Research institutions have not taken up projects in the area.
5. There is no staff member meant exclusively for the sanctuary. Thus, implementation of the planned programmes is hampered.

Immediate Actionable Points

1. The entire boundary area should be fenced on a priority basis.
2. Considering that Oussudu Lake is one continuous lake, there should be just one management plan for the entire lake regardless of the state boundary (Pondicherry and Tamil Nadu). This plan should also take into consideration the tanks in the surrounding areas.

3. An eco-tourism plan should be prepared with the participation of stakeholders. The plan should consider the possibility a well-planned interpretation centre with an audio-visual facility and, possibly, an ideally-located watchtower. The expertise of qualified individuals or organizations should be sought for the purpose. There could also be a capacity building programme for the local youth to act as tourist guides.
4. A feedback form may be designed for the visitors, and the information collected thereof could be analyzed when the management plan is reviewed.
5. An Eco-development Plan should be developed and implemented. There should be one person employed exclusively for this work.
6. There should be an exclusive Forester and two Forest Guards to plan and implement the programmes of the sanctuary.
7. Educational and information material could be developed and printed for distribution and sale. There should be a well-planned and written programme for developing awareness in educational institutions. A part-time education officer could be employed on contract, or the help of NGOs sought for conducting awareness programmes for the villagers and the students of the schools in the surroundings.
8. At least one vehicle is to be provided exclusively for the use of the sanctuary, especially for organizing awareness and eco-development programmes.
9. There should be a well-planned habitat management programme. The lake should be free from weeds. The *Prosopis* must be removed and replaced with tree species suitable for roosting of local birds. The African catfish could be selectively removed. The sources of pollution, especially in the surrounding areas, should be addressed. The whole programme should be monitored systematically.
10. The academic institutions near to the area may be encouraged to take up short-term and long-term studies.

Evaluators
Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

28. Sakkarakottai Bird Sanctuary, Tamil Nadu
MEE Score- 51.67% (Fair)

Management Strengths
1. The sanctuary is a tank surviving on rains and on water from the river Vaigai, whenever it is available. According to the management plan, the sanctuary supports 35 plant species, 31 species of birds, five mammal species (including the jackal, black-naped hare and grey mongoose), 10 reptile species and three amphibian species. The Spot-billed Pelican is mentioned as the flagship species. The sanctuary has no human habitations within it. With the sanctuary being very close to Ramanathapuram city, there is every possibility of developing it into a birdwatchers' paradise.

Management Weaknesses
1. The sanctuary depends on rains and on water from the river Vaigai. Unfortunately, these are not reliable sources, and so there is uncertainty in maintenance of water levels. Often the available water is not sufficient to attract birds.
2. The rights of the people around sanctuary have not been settled and hence the boundary has not been demarcated. The final notification has not been issued. There is no participation of the people in the management and activities of the sanctuary.

3. There is practically no manpower, except for the two anti-poaching watchers in the field. The Range Forest Officer and the Forester have other areas under their jurisdiction.

Immediate Actionable Points

1. The settlement of rights is to be completed immediately so that the boundaries can be demarcated.
2. The second priority should be to attract birds to the area. The habitat has to be secured by removing the *Prospois* and planting roosting trees. Discussions should be held with officials of the irrigation department to ensure that at least a minimum level of water is maintained in the channels.
3. An action committee may be formed under the chairmanship of the District Collector, with Wildlife Warden as the Member Secretary and the officials involved as the members. The people's representatives may be invited to the meetings. Problems could be discussed and settled.
4. An awareness programme may be organized for the people's representatives and the officials of the departments involved. The importance of the area should be highlighted and their support for conservation sought. This should be projected as an opportunity for the people of Ramanathapuram city.
5. Considering the disturbance from the traffic along the road bordering the sanctuary, a no-horn zone may be declared, with appropriate signage. The department involved may be approached for implementation.
6. A plan of operation could be written with actions, time-frame and mentioning the persons responsible.
7. An Eco-Development Plan should be put in place and implemented.
8. There should be at least two forest guards exclusively for the area.
9. The academic institutions in and around Ramanathapuram city may be encouraged to take up short-term studies as a part of students' projects.

Evaluators
Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

29. Theerthangal Bird Sanctuary, Tamil Nadu

MEE Score- 67.50% (Good)

Management Strengths

1. Though the area of this sanctuary is only 29.29 ha, it is visibly rich in birds. It is a tank in Therthangal village that receives water mostly from rainfall and from a channel of the river Vaigai. According to the management plan, 35 plant species, 43 bird species, five species of mammals, 11 reptile species and three amphibian species are found in the sanctuary.
2. The area has a very good population of birds. Nine species of birds have been reported to breed in Therthangal. The Spot-billed Pelican is mentioned as the flagship species.
3. The area is free of human habitations, but it is surrounded by villages, with several kanmois (irrigation tanks) and ooranis (village ponds), which are part of traditional rain water harvesting system and provide feeding grounds for the birds.
4. The area is about 15 km from the district headquarters, and thus it is free of crowds, noise, pollution and other such adverse environmental factors.
5. The area has the potential to become a peaceful tourism centre with beautiful birds sighting around.

6. The people of the area are supportive of the activities and are even willing to be part of the management of the sanctuary, expecting nothing in return.

Management Weaknesses

1. The proceedings relating to settlement of rights under sections 19 to 25 of the Wildlife Protection Act 1972 are yet to be completed by the District Collector.
2. The sanctuary is mostly fed by rains and by a distributary channel of the river Vaigai. The water flow is restricted to the few months of rainfall. If, and only if, there is a good flow of water in the Gundar, the sanctuary receives a good quantity of water. There are five sluices that drain water to agricultural lands. Excess water is let out during floods, through a sluice gates, towards Therthangal village. The area is managed by the PWD as a source of water for agriculture.
3. There is practically no manpower except the four anti-poaching watchers in the field. The Range Forest Officer and the Forester have other areas under their jurisdiction. The watchtower is the only facility available for visitors.

Immediate Actionable Points

1. The settlement of rights is the top priority and should be completed immediately so that the boundaries can be demarcated.
2. The next priority should be to attract birds to the area. The habitat has to be secured with the removal of the *Prosopis* and planting of roosting trees. Discussions should be held with the officials of the irrigation department to ensure that a minimum level of water is maintained in the channels.
3. The public suggest that the channels should be deepened to ensure that water is available for a longer period each year.
4. Awareness programmes may be organized for the public in general, with a focus on students.
5. A Tourism Plan may be developed and implemented with a stress on the participation of, and benefits to, the villagers.
6. An Eco-Development Plan should be put in place and implemented.
7. There should be two forest guards exclusively deployed for the area.
8. The academic institutions in and around Ramanathapuram, may be encouraged to take up short-term studies as a part of students' projects.

<u>Evaluators</u>
Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

30. Udayamarthandapuram Bird Sanctuary, Tamil Nadu
MEE Score- 60% (Good)

Management Strengths

According to the management plan, the sanctuary was declared on the basis of a request from the people. The area has no human habitations within. The mid-winter bird count in January 2017 recorded 37 water bird and 61 land bird species, with a total of 5217 water birds and 614 terrestrial birds. The area is reported to have very good populations of the Openbill Stork and the White Ibis. About 154 plant species are listed in the plan. The habitat diversity indicates the potential of supporting a good population of birds.

ManagementWeaknesses

According to the management plan, lack of an effective local-level institutional mechanism, to coordinate activities at various levels within the state government for conservation and development of Udayamarthandapuram Lake, is the major reason for the degradation of the environment of the lake. There is no perennial water source, and the tank depends on water from rains during the north-east monsoon and on water from the Mettur dam. The tank has the problem of siltation. The runoff from the catchment areas brings in chemicals from the fertilizers and pesticides used in the paddy fields, threatening the survival of organisms. The degradation of the feeder channel contributes to the problem of soil erosion. The boundary is not protected with a fence. The birds depend on tanks and paddy fields in the surrounding areas and are prone to poaching. The area is infested with aquatic and terrestrial invasive species. The pressure of cattle grazing increases in summer. The cyclone Gajah has practically devastated the area, with fallen trees depriving the birds of roosting places.

Immediate Actionable Points

1. Actions have to be initiated for habitat restoration through appropriate programmes to overcome the impact of the cyclone Gajah.
2. The feeder channel should be managed and maintained properly.
3. Habitat restoration through removal of invasive species should be taken up.
4. The proposed eco-sensitive zone is to be declared, and vulnerable areas need to be identified and protected.
5. De-siltation of the lake and strengthening of the bunds is required to be carried out.
6. NGOs and educational institutions may be identified and involved in the programmes of the sanctuary.
7. The available human resources are to be enhanced by increasing the number of guards and anti-poaching watchers, and engaging a field expert for conducting bird monitoring and awareness programmes.
8. The suggestions of the management plan, regarding eco-development, visitor management and research and monitoring, need to be reviewed and implemented.
9. The review of the management plan should consider the impact of cyclone Gajah on the habitat and make a detailed action plan for habitat restoration.

Evaluators

Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

31. Vaduvoor Bird Sanctuary, Tamil Nadu
MEE Score- 59.17% (Fair)

Management Strengths

The sanctuary was declared on the basis of a request from the people, according to the management plan. The area has no human habitations within, and the people around are reported to be supportive to conservation activities. The annual bird count was carried out in the last year. and 114 species of birds, with a total population of about 24,000, were recorded. This included 53 species of water birds. The other fauna of the area includes three species of mammals, 38 species of fish, nine species of reptiles, five species of amphibians, eight species of odonates and 24 species of butterflies.

The sanctuary is a birdwatchers' paradise due to the large number and diverse bird population.

Management Weaknesses

There is no perennial water source, and the tank depends on the rains received during the north-east monsoon and on the water received from Mettur dam from August to January. The tank has a problem of siltation. The degradation of the feeder channel contributes to the problem of soil erosion. Fishing by fishermen from the surrounding villages has also been identified as a problem. There is also a conflict of interest as the people in the villages extract water for irrigation without considering the bird life in the sanctuary. The birds depend on the tanks and paddy fields in the surrounding areas, and are subject to poaching.

The runoff from the catchment areas brings in chemicals from the fertilizers and pesticides used in the paddy field, threatening the survival of organisms. There is also a threat of waste dumping because of the proximity to the highway and villages.

The sanctuary has the problem of invasive species such as *Prosopis chilensis, Eichhornia crassipes* and *Ipomoea carne*a. Grazing by cattle, though not identified as a major issue, is reported to be a threat. There is no exclusive staff for the sanctuary except a Forest Guard and two watchers on contract.

Immediate Actionable Points

1. The staff strength of the sanctuary should be increased by adding a Forester, an additional Forest Guard and more watchers during the season when the birds arrive. The guards should be given the responsibilities of eco-development, habitat management, visitor management and protection.
2. The sanctuary management should prioritize actions with due consideration to the habitat and visitor management.
3. The management plan has identified threats. A plan of operation could be written with actions and time frame, and should mention the persons responsible. Thus, there should be plans for habitat management, eco-development, visitor management and protection.
4. The habitat interventions should be documented and monitored with the help of qualified experts from nearby colleges and universities. The programme could be implemented in a project mode with financial assistance.
5. The nearby colleges and universities may be encouraged to take up research projects in the area.
6. It will be appropriate to engage the services of an experienced tourist guides to handle visitors and organize awareness programmes in educational institutions.

Evaluators

Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

32. Vedanthangal Bird Sanctuary, Tamil Nadu

MEE Score- 61.67% (Good)

Management Strengths

1. The sanctuary, though small in size, has an abundance and diversity of birds. The 5 km radius area declared as part of the sanctuary provides ample opportunity for involvement of public through eco-development activities.
2. The sanctuary has a history and tradition of extending protection to the birds and ecosystem.
3. The proximity of the sanctuary to the capital city, Chennai, makes it more important because of the opportunities it offers city dwellers to be in a natural area with birds.

4. The people of the area in general are co-operative and happy to associate with the activities of the sanctuary.

ManagementWeaknesses

1. The lake mostly provides roosting space for birds. The feeding extends to the tanks and paddy fields in the surrounding areas.
2. No assessment has been carried out on the resources of the surrounding area, and no information is available on the utilization of the area by birds. There is no landscape-level plan in place.
3. There is no Eco-development Plan in place though few actions have been initiated recently.
4. There are no facilities to accommodate the visitors, especially students, if they prefer to stay back in the sanctuary.
5. The manpower is insufficient to manage the area effectively and to implement the plans. The only exclusive staff members of the sanctuary are a Forester and forest watcher.
6. There is no systematic plan to monitor the bird population, in different seasons in all the possible areas around (tanks, paddy fields, etc.), involving experts and even beginners such as students. However, sightings of birds and their abundance are recorded periodically.

Immediate Actionable Points

1. A well designed dormitory that can accommodate at least 30 people must be constructed. This should have all facilities.
2. The present Interpretation Centre could be converted to an eco-shop and an Interpretation Centre could be developed as part of an audio-visual facility.
3. An audio-visual facility with the necessary equipment may be thought of to facilitate environmental education for both the villagers and visitors.
4. The new Interpretation Centre should try to convey the role of birds in the life of people and the ecosystem services provided by Vedanthangal Bird Sanctuary and introduce the various aspects of the sanctuary.
5. A feedback form may be designed for the visitors, and the information received from visitors could be analyzed for improvement and incorporation in the management plan.
6. An Eco-development Plan should be in place and actions taken to implement it.
7. There should be a Forest Range Officer exclusively for the sanctuary and a Forester and two Forest Guards to plan and implement programmes of the sanctuary.
8. Selected, educated local youth may be trained and used as tourist guides, or anti-poaching watchers, or for implementing eco-development programmes.
9. Educational and information material could be developed and printed for distribution and sale.
10. An Education Officer could be employed on contract, or the help of NGOs may be sought for conducting awareness programmes among the villagers and students of the surrounding schools.
11. At least one vehicle need to be provided exclusively for works related to the sanctuary.
12. Actions may be initiated to address the problem of invasive species, especially the African catfish. A plan must be prepared with the help of experts in the field and implemented.
13. The help and co-operation of organizations based in Chennai (e.g., Zoological Survey of India, Care Earth Trust) may be enlisted for planning and implementation of programmes for the sanctuary.
14. Financial support could be mobilized from industries with the help of NGOs for specific projects.

Evaluators
Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

33. Vallanad Blackbuck Sanctuary, Tamil Nadu
MEE Score- 50.83% (Fair)

Management Strengths
The sanctuary is the home of the southernmost population of the blackbuck, with about 124 animals. The area has thorny scrub vegetation and has about 47 listed plant species. Twelve species of mammals are found in the area, including the jackal, sambar deer, spotted deer, mongoose and black-naped hare. The Management Plan lists 17 bird species. The sanctuary is the only hill in Thoothukudi District.

ManagementWeaknesses
The Sanctuary has at least 10 villages in the immediate vicinity. The boundary is porous in several places. There is an explosives godown just on the periphery of the sanctuary. There are a number of feral cattle in addition to those left into the sanctuary by the villagers. There is no approved Management Plan in place. The draft itself needs to be revised thoroughly. The National Highway passing very close to the sanctuary is a threat because blackbucks straying out get hit by speeding vehicles. There is no involvement of the public in the management, and there are no eco-development plans in place. The sanctuary does not have a priority action list or plans.

Immediate Actionable Points
1. The Management Plan needs to be revised with the involvement of the stakeholders and the approval of the revised plan by the competent authority has to be obtained.
2. There has to be an action plan in place for effective removal of the feral cattle and for preventing grazing by the livestock from the adjoining villages.
3. The management actions should be prioritised and taken up on the basis of the severity of the threats. They should be carried out in the following sequence: completion of fencing, removal of explosives, and removal of cattle.
4. The proposed eco-sensitive zone must be notified and the management must connect with the villagers and promote some income-generating activities for them.
5. Actions should be initiated to form Eco-development Committees.
6. NGOs and educational institutions must be identified and involved in the programmes of the sanctuary.
7. The available human resources must be enhanced by increasing the number of Guards and anti-poaching watchers. Conducting training programmes for staff on PA management with experts could also be thought of.
8. Field experts must be engaged to conduct population estimation exercises. The present method of estimating populations should be reviewed, and a scientifically sound method should be adopted.
9. There should be an inventory of the plants and animals of the sanctuary. The work could be entrusted to institutions that are credible and have expertise. The inventory should also include information on abundance.
10. Very basic visitor facilities could be planned and implemented.

11. Attempts are being made to establish grasslands by clearing the natural vegetation. The naturally occurring trees are thorny and sparse. Grassland should be developed only in gaps, and the clearing of natural vegetation should be suspended.
12. Bore-wells are energised with solar pumps; however, in some places oil pumps have been provided. These should be replaced by solar pumps in due course.

Evaluators
Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

34. Vellode Bird Sanctuary, Tamil Nadu

MEE Score- 61.67% (Good)

Management Strengths

1. The sanctuary is a tank receiving water from rainfall and from seepage from the Lower Bhavani Project canal. This area harbours about 130 species of birds in an area of 77.185 ha. An area of about 500 m width around the sanctuary has been proposed as an eco-sensitive zone. Though a total of 129 species of aquatic and terrestrial plants have been recorded in the sanctuary, it is dominated by *Acacia nilotica*. This area is within a human-dominated landscape, with six villages with a population of about 985 households, one-third of which are below the poverty line. The sanctuary is not under any biotic pressure, except perhaps for threats from invasive species such as the African catfish and *Prosopis*.
2. The sanctuary is hardly 12 km from the city of Erode, and it is probably the only place for recreation and outings for the people of the city. It can be developed further by providing ample opportunities for bird-watching and imparting conservation education. This is especially true for students who wish to have field exposure and learning experiences without being in a real wilderness with lots of wildlife around.
3. The people around the sanctuary are very happy to be a part of the management and are aware of the benefits of having a bird sanctuary in their village.

Management Weaknesses

1. The approved sanctuary Management Plan expired in March, 2018 and the new one is in the making. Suggestions made in the earlier management plan must be brought into the new Plan and should be based on strategies aimed at improving the area as a place for birds, visitors and villagers.

2. The lake mostly provides roosting space for birds. The feeding grounds are reported to be the paddy fields and other places in the surrounding areas. No assessment has been carried out for the resources available in these areas.

3. Though Eco-development Committees are in place and meetings are held, with minute books being maintained, proper micro-plans are yet to be put in place.

4. There are no facilities to accommodate visitors, especially students, who may wish to stay overnight.

5. The manpower is insufficient to manage the area and implement the plans. The staff exclusive to the sanctuary consists of only two Forest Guards and a forest watcher.

6. Periodic monthly and annual bird counts used to be conducted. However, the data from these counts have not been analyzed properly to formulate an effective management strategy.

7. Though the services of an expert botanist are available, the changes in the vegetation due to the removal of invasive species and other activities have not been documented and monitored appropriately.

8. The Interpretation Centre lacks adequate space and does not provide more than the basic details. The display at the centre is limited to pictures of birds and to identification of birds from calls using software.

Immediate Actionable Points

1. A dormitory with basic but adequate facilities must be constructed to accommodate visitors. The dormitory would help in the planning of nature camps.
2. The present Interpretation Centre could be converted to an eco-shop and an Interpretation Centre could be developed as part of an audio-visual facility.
3. An audio-visual facility with the necessary equipment may be thought of to facilitate environmental education for both the villagers and visitors.
4. The new Interpretation Centre should try to convey the role of birds in the life of people and the ecosystem services provided by the bird sanctuary and introduce various aspects of the sanctuary.
5. A feedback form may be designed for the visitors, and the information obtained could be analyzed for improvement and incorporated in the management plan.
6. An Eco-development Plan should be put in place and actions taken to implement it.
7. There should be a Forest Range Officer exclusively for the Sanctuary and a Forester and two guards (additionally) to plan and implement programmes.
8. Selected, educated local youth may be trained and used as tourist guides, anti-poaching watchers, or for implementing eco-development programmes.
9. Educational and informative material could be developed and printed for distribution and sale.
10. An Education Officer could be employed on contract, or the help of NGOs sought, for conducting awareness programmes among the villagers and students of nearby schools.
11. At least one vehicle should be provided exclusively for the use of the sanctuary.
12. The actions taken to remove African catfish are definitely good. However, they should be continued periodically till the species is wiped out. Plugging the sources of invasion (the seepage from the Canal and even the proposed sluice) is crucial and can be achieved by fixing grills or small-sized meshes at the entry points.
13. The academic institutions in and around Erode may be encouraged to take up short-term studies as a part of student projects.
14. Industries in Erode District may be involved in education, awareness and eco-development programmes as a part of their Environment Corporate Responsibility/Corporate Social Responsibility initiatives. The help of NGOs could also be sought for this purpose.

<u>Evaluators</u>

Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

35. Vettankudi Bird Sanctuary, Tamil Nadu

MEE Score- 61.67% (Good)

Management Strengths

The sanctuary consists of three rain-fed *kanmois* (traditional irrigation tanks) of Vettangudipatti and Kollukudipatti villages, of Tirupathur Taluk, in Sivaganga District. It is 38.426 ha in extent and was declared as sanctuary on 3rd June 1977. In addition to 32 species of aquatic plants, the sanctuary supports 155 other species of plants. The dominant trees are *Acacia nilotica* and *Prosopis juliflora.* The avifaunais rich, with 127 species of birds of various IUCN categories, and includes migratory ones. The Black-headed (White) Ibis and Spot-billed Pelican are considered the flagship species of the sanctuary. The area also has four species of mammals, 7 species of reptiles and 4 species of amphibians. The villagers are very supportive of the sanctuary and consider the birds as *kovil paravai* (temple birds), extending protection to them. This sanctuary is the only bird sanctuary in the district and finds a place in the tourism maps of the district and state. The area has a well-written Management Plan with prescriptions to address the problems.

Management Weaknesses

1. The sanctuary depends entirely on the rain water stored in three tanks. The feeder channel from Melekanmoi is deep in some places, preventing easy flows of water. The flow of water which takes place from the northern region during rains was blocked due to the construction of a road. From the 1980s, birds are seen nesting only in Periyakollukudi Kanmoi because of a lack of sufficient water and roosting places in the other two *kanmois*. There is no Eco-development Plan in place, and the activities of the EDCs are not co-ordinated well. There is scope for more interaction with the villagers.

2. The sanctuary is only a part of the Tirupathur Range and it is not even a section. There is no man power, except for the two anti-poaching watchers in the field. The Forest Range Officer, the Forester and the Forest Guard of Tirpathur Range manage the affairs of the sanctuary along with other responsibilities of the range.

Immediate Actionable Points

1. The boundary of the sanctuary should be demarcated on the ground and the sanctuary fenced.
2. The habitat has to be secured with the removal of *Prospois* and planting of roosting trees. The feeder channels have to be appropriately cleared and leveled to ensure that there is free flow of water to the tanks when it rains. The blockage of the seasonal stream due to the construction of the road has to be addressed.
3. There should be at least a Forester and a Forest Guard exclusively for the sanctuary. The area could be treated as a Section within the Tirupathur Range.
4. An Eco-development Plan should be prepared in consultation with the Eco-development Committee (EDC) members and actions taken to implement it. The drinking water problems of the villagers may be addressed on a priority basis.
5. The academic institutions in and around Sivaganga may be encouraged to take up short-term studies as a part of student projects and long-term ones with external financial support.
6. The prescriptions in the Management Plan may be implemented. There could be a stakeholder meeting involving tourism operators, naturalists, transport department representatives, researchers, villagers, etc. to prioritize the activities and to gain support for these.

7. The Management Plan should be reviewed annually.
8. The bird count may be done at least three times, once each in winter, summer and rainy season. The tanks and *ooranis* in the adjacent areas (listed in the Management Plan) may also be included for this exercise.
9. Priority may be given to the villagers and students while organizing nature camps.
10. The services of an Interpretation Officer/ or biologist may be obtained for monitoring activities and for conducting awareness programmes.
11. The possibilities of obtaining financial support from other departments such as the Tourism and Rural Development departments may be explored with a well-written Plan.
12. The focus should be on habitat improvement, eco-development and eco-tourism development, strengthening the bunds and providing good pathways.

Evaluators

Shri B.K. Singh, Former PCCF, Government of Karnataka
Dr. Lalit Kumar Sharma, Scientist-C, Zoological Survey of India
Dr. P.S. Easa, Former Scientist, KFRI
Dr. Asha Rajvanshi, Senior Professional Fellow, WII

TELANGANA

1. A system for monitoring the status of management planning for the PAs may be set up in the Ministry with incentives and checks through the ongoing central assistance arrangements.
2. States in general may be advised to develop a system of documentation of field related information by the field staff during their field visits, and simultaneous collation of such information for building a robust information base. This can be a very useful way of assessment of the state of PA for management planning.
3. Peoples interface on PA management is overall very weak everywhere. A focused approach to encourage this would be useful in not only participatory work on conservation, but also for management of the ESZs now notified for almost all PAs.
4. Administrative arrangements of several PAs in the states of Telangana and AP need a relook. After the reorganization of the forest divisions, such PAs are distributed in more than one units and so challenges of coordination and management focusses exist. States of AP and Telangana may be advised to look into the need of a unified management command for each PA.
5. **ShivaramWildlife Sanctuary:** The main focus—the Crocodile habitat in Godavari river — is convenient to manage, and it is in a good state. The area has the potential to attract visitors and impart awareness about conservation of the terrestrial and aquatic biodiversity. A unified management command is needed for the PA area on both banks of the river. Support for strong conservation education facilities may be considered in the APO.
6. **PocharamWildlife Sanctuary:** The compact expanse of the sanctuary, its open grasslands and its perennial streams provide a good habitat for wildlife. The large Pocharam Reservoir nearby makes the water regime of the area sustainable and provides opportunities for integrating tourism into environment education by designing a tourism circuit. The proximity to Hyderabad and suburban areas provides opportunities for scaling up the number of visitors by developing environment education facilities. Tourism will provide the local people economic stakes.Support for conservation education and network of anti-poaching camps/ watchtowers may be provided on priority in the APOs.

7. **Pranahita Wildlife Sanctuary:** A good diversity of birds is present. A total of 57 species have been listed in the management plan. The forests of Asifabad District, towards the north-west, provide continuity to the habitat between the Tiger reserves of Kawal and Indravati, in Chattisgarh. There are several grassland patches that provide open space and a good habitat for Blackbuck to thrive in. Its management can be based on the landscape continuity requirements of the Kawal tiger landscape.

36. Lanja Madugu Siwaram Wildlife Sanctuary, Telangana

MEE Score- 64.17% (Good)

Management Strengths

1. The Sanctuary has a viable Crocodile habitat, managed scientifically and is conducive for long time conservation of the species.
2. Human interference is not a management issue, as the area is bordered by forests of the sanctuary on both banks of the river.
3. The area has the potential to attract visitors and impart awareness about conservation of the terrestrial and aquatic biodiversity.

Management Weaknesses

1. The sanctuary is almost surrounded by agricultural areas, and so a growing population of herbivores may give rise to concerns of human–wildlife conflicts.
2. The existing fish resources are the only source of food for the significant population of all age classes of Crocodile in the 4 km stretch of the river. With the locals (about 48 families according to the management plan) also practising fishing for subsistence in the area, food availability may become a concern for the sustenance of the Crocodile population.

Immediate Actionable Points

1. As some visitors keep visiting the area for boating and Crocodile sighting, a well-designed signage and interpretation system should be developed in the sanctuary at the reception, highlighting the conservation significance of the species of importance of the PA.
2. As the neighbouring communities depend on the forest areas for grazing, small timber, fish, etc., their participation in the PA management should be ensured by developing a vibrant interface through eco-development action.
3. The PA management has been conducting an annual census that is based on direct sightings. It is suggested that, at least for the Crocodiles, scientific methods be adopted to make the data more authentic for management planning.
4. A practice of collection of data by the staff on protection duty may be introduced. The collected data should be compiled periodically to improve the understanding of the habitat and the state of the wildlife.

Evaluators

Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC

Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala

Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)

Shri Vinod D.K., IFS, Scientist on Deputation to WII

37. PocharamWildlife Sanctuary, Telangana
MEE Score- 68.33% (Good)

Management Strengths

1. The compact nature of the sanctuary, its open grasslands and its perennial streams provide a good habitat for wildlife.
2. The large Pocharam Reservoir nearby makes the water regime of the area sustainable, and provides opportunities for integrating tourism into environment education by designing a tourism circuit.
3. The proximity to Hyderabad and suburban areas provides opportunities for scaling up the number of visitors by developing environment education facilities and thus providing economic benefits to the local people through tourism.

Management Weaknesses

1. The sanctuary is not ecologically connected to the larger landscape, giving rise to concerns about its viability and dispersal.
2. Though the area was a hunting ground of the erstwhile rulers, no management infrastructure was observed in the PA.
3. The PA management has not institutionalized the collation and analysis of data collected through censuses or field observations. As a result, there is a lack of information about the flora, fauna and ecological aspects of the area.

Immediate Actionable Points

1. A network of anti-poaching camps and watchtowers may be established to ensure that the perambulating staff have appropriate shelter and monitoring facilities.
2. A system of recording information of interest, such as sightings, evidence of animals, Human Wildlife Conflict cases, kills and incidences of fire, by the staff and collation and analysis for building an information base may be started and institutionalized in the PA itself.
3. The sanctuary has many good open areas that are ideal for herbivores. Nurturing these by occasional interventions such as seasonal closing and seeding of palatable species may help restore the habitat.
4. EDCs may be made functional primarily for participation in the primary response to HWC cases.

Evaluators

Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC

Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala

Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)

Shri Vinod D.K., IFS, Scientist on Deputation to WII

38. Pranahita Wildlife Sanctuary, Telangana
MEE Score- 55.83% (Fair)

Management Strengths

1. A good diversity of birds occurs in the Sanctuary with a total of 57 species listed in the management plan.
2. The forests of Asifabad District, towards the north-west, provide continuity to the habitat between the Tiger reserves of Kawal and Indravati, in Chhattisgarh.
3. There are several grassland patches that provide open space and a good habitat for Blackbuck to thrive in.

Management Weaknesses

1. There is unabated human pressure on the habitat from the habitations all around, including the area on the east, between the river and the PA boundary. It is reported that there are 37 villages within 2 km distance of the sanctuary, with three villages inside, in two enclaves.
2. There is no infrastructure for protection activity. Hardly any facility has been organised.
3. There are no eco-development activities. Though it has been indicated that five VSSs are operative, no significant interaction was noticed.
4. The PA is part of a forest range of the territorial division and so does not find priority in management.

Immediate Actionable Points

1. As the PA is dedicated to the Blackbuck, the open spaces within it need to be managed to support the species and should not be planted with tree species as was noticed. Habitat management activities should aim at promoting palatable forage for herbivores.
2. As the PA is surrounded on all sides by habitations, the boundary needs to be marked to avoid litigation.
3. Incidences of crop raiding by Wild Boars and Blackbuck need a solution through combined efforts. EDCs need to be more participative and effective. An eco-development plan should be drawn up and implemented to ensure that the boundary and HWC management are effective.
4. Though the PA has the rivers Pranahita and Godavari on the eastern and southern boundaries, the habitats in it are drought-prone. With adequate funds being available now, effective and innovative water management activities can be taken up so that the PA can become an important part of the larger landscape.
5. With many people travelling around to visit nearby temples and to use the ferry service across the river Pranahita, nearby, a suitable nature interpretation centre can be created and some tourism management activities conducted to impart nature education and develop awareness in the area.

<u>Evaluators</u>
Dr. S.K. Khanduri, IFS, Former IG (WL), MoEFCC
Dr. E.A Jayson, Research Coordinator, Kerala Forest Research Institute, Kerala
Dr. Arun Mani Dixit, Consultant World Bank Centre for Environment and Social Concerns (CESC)
Shri Vinod D.K., IFS, Scientist on Deputation to WII

EASTERN
REGION

3.3 EASTERN REGION

PA ID	Name of NP&WLS	State
1	Pant (Rajgir) WLS	Bihar
2	Udaipur WLS	Bihar
3	Gomardha WLS	Chhattisgarh
4	Pamed WLS	Chhattisgarh
5	Mahauaduar WLS	Jharkhand
6	Parasnath WLS	Jharkhand
7	Topchanchi WLS	Jharkhand
8	Bhitarkanika WLS	Odisha
9	Khalasuni WLS	Odisha
10	Kuldiha WLS	Odisha
11	Nandankanan WLS	Odisha
12	Sunabeda WLS	Odisha
13	Haliday Island WLS	West Bengal
14	Jaldapara NP	West Bengal
15	Mahananda WLS	West Bengal
16	Raiganj WLS	West Bengal
17	Sajnakhali WLS	West Bengal


BIHAR
JHARKHAND
WEST BENGAL
CHHATTISGARH
ODISHA
1
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3
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BIHAR

On the evaluation of management effectiveness of the two sanctuaries of Bihar *viz*., Pant Rajgir WLS and Udaipur WLS,it is evident that there are need of some concerted efforts for improvement of the protected areas in Bihar. Following suggestions furnished for the consideration of the State Govt.:

1. The proposed development of Safari park in Pant WLS Rajgir, needs approval of the National Board of Wildlife and the Ministry of the Environment Forests and the Climate Change. The park also needs approval of plan of CZA.

2. There is need of proper research/ study of water body particularly in Udaipur WLS which has large wetland area for the water quality, weed control, fisheries development, soil & water conservation.

3. In-spite of the well-developed wetland in Udaipur WLS, there is hardly any visit of migratory bird. The WLII and Zoological survey of India may be requested to advise for some study and action required to develop suitable habitat for the migratory birds.

4. The State Govt. should take action for de-siltation from the lake in the Udaipur WLS.

5. Effort should be made for introduction of herbivore in the forested area of the Udaipur WLS and protective measures by erecting fencing all-around.

6. Estimation of population of major species (census) should be taken up at regular interval.

7. Research studies of fauna and flora need to be taken for the assessment of palatable plant and habitat improvement on all the PAs.

8. Strengthening of staff with young and trained staff in protected areas should be taken up on priority basis.

9. There is need to have proper Eco-tourism policy for regulation of tourism in the sanctuaries particularly to control tourist influx in the Rajgir WLS and to promote tourism in Udaipur WLS

1. Pant (Rajgir) Wildlife Sanctuary, Bihar
MEE Score-68.75% (Good)

Management Strengths

1. Rajgir Wildlife Sanctuary is a remnant patch of forest nestled in the picturesque Rajgir Hills, in the South Gangetic Plain, which is an important habitat for wildlife and provides important ecosystem services.
2. The PA is well protected, with natural boundaries.
3. The Rajgir Wildlife Sanctuary is rich with NTFPs, most significantly plants with high medicinal value.
4. The quality of the habitat is good. The ground cover includes trees of different age groups and ground flora.
5. The sanctuary is a significant tourist destination. It is an area of archaeological and religious significance that attracts both national and international tourists. It is also of prime religious and cultural significance for Buddhists, Jains and Hindus alike, and it is dotted with numerous shrines, relics and monuments to the past. Protecting this sanctuary, which is far more important to the larger ecological, agricultural and cultural landscape than its mere size suggests, is consequently important.

6. The sanctuary enjoys good support from the political and local administration.
7. The PA has a good research base. There is a list of the major biodiversity components.

Management Weaknesses

1. There is no estimation or regular monitoring of the major animals.
2. The sanctuary has no sanctioned staff.
3. The existing manpower is not trained in wildlife management.
4. The ecological connectivity of the PA with other areas is poor.
5. Collection of NTFP, timber and firewood, lopping and cattle grazing impede regeneration, which is key to the rejuvenation of this sanctuary. There is a need to protect the existing rootstock of vegetation. However, the sanctuary is located in a densely populated area, and it is surrounded by 23 villages. This exerts a considerable biotic pressure on a tiny patch of forest. There are no alternative grazing lands available for the local livestock.
6. The sanctuary faces water shortages particularly during summer. This hampers biodiversity conservation in the sanctuary, particularly in terms of attracting migratory birds.
7. The sanctuary faces declining biodiversity values. The hills of Rajgir earlier had wolves, bears and hyenas, and blackbuck. However, due to intense anthropogenic pressures, habitat loss and degradation of the habitat, the number of predators and overall biodiversity values of both the flora and fauna have declined significantly.
8. There is no connectivity with any other protected areas.
9. There is a high tendency for man–animal conflicts to take place because of increasing populations of nilgai and wild pigs and an absence of large predators.
10. The sanctuary is highly vulnerable to forest fires.
11. There is intense tourism pressure.
12. The local people depend on the sanctuary for collection of fuelwood and medicinal plants. Also it is easily accessible for cattle grazing.

Immediate Actionable Points

1. A census of the major wildlife species needs to be conducted to develop a baseline, and the wildlife must be monitored on a regular basis.
2. Dedicated staff should be recruited on priority for the management of the sanctuary.
3. There is need to establish check posts/gates at strategic locations
4. The eco-tourism needs to be streamlined in accordance with the principles of responsible tourism.
5. Grasslands need to be developed for the wildlife by opening the canopy, under the guidance of experts.
6. Awareness must be created amongst the local communities and other stakeholders.
7. Local capacity for eco-development planning needs to be developed. Simultaneously, micro-plans should be developed for different EDCs. Entry point activities need to be carried out for EDCs. Approach roads may be constructed to hamlets. Drainage systems also need to be improved for villages. Addition to above, following also need to be done for EDCs:
    a. Vocational training of local youth for self-employment.
    b. For alternate livelihoods local communities must be involved in forestry operations as forest watchers. They should also be involved in ecotourism.
    c. Activities for reducing fuel wood consumption should be carried out. Supply of LPG connections, cooking stoves and solar lamps to all households be carried out in a phased manner.
    d. Use of fuel wood for commercial purpose should be banned.

e. Raising fuel wood plantations in the village common lands in non-PA areas, the buffer zone and fringe areas
f. Promote use of animal dung and agricultural residues
g. Promoting use of electric crematoria.

8. The proposed Safari park in the sanctuary should be developed after due permission of the NBWL and the ministry as per the plan approved by the CZA.

Evaluators
Shri Azam Zaidi, Former PCCF/ HoFF & CWLW, Government of West Bengal
Shri P. Krishna Mohan, Former APCCF (Wildlife) Odisha
Dr. Diwakar Sharma, Director, Programme Management, M&E, WWF-India, New Delhi
Dr. Bilal Habib, Scientist-E, WII

2. Udaipur Wildlife Sanctuary, Bihar
MEE Score- 63.39% (Good)

Management Strengths
1. The PA has a well-defined area with luxuriant vegetation. It has a huge wetland.
2. It has unique biodiversity having a large wetland and well stocked forested area.
3. The PA is well protected by ex-army personnel and home guards.
4. The quality of the habitat is good. It has a cover of trees of different age groups and rich ground flora.
5. The PA has a large perennial water body that supports aquatic life and birds.
6. The locals support the PA management, and the EDCs co-operate with the management.
7. There is good support from the local administration.
8. The PA has a good research base. There is a list of the major biodiversity components and wetland parameters.
9. There are no major human–wildlife conflict issues.

Management Weaknesses
1. Weeds have invaded certain pockets of the wetland.
2. Siltation is decreasing the depth of the water body.
3. There is no estimation of the populations and regular monitoring of the major animals.
4. The sanctuary has inadequate sanctioned staff.
5. The existing manpower is not trained in wildlife management.
6. The ecological connectivity of the PA with other areas is poor.
7. The road connectivity of the WLS with Bettiah town is very poor.
8. The funds available for the management of the sanctuary are insufficient.

Immediate Actionable Points
1. As a part of ecological monitoring, populations of major wildlife species should be estimated scientifically.
2. Soil and moisture conservation initiatives need to be carried out in the catchment of the Saraiman lake to reduce siltation.
3. Research studies need to be conducted on controlling weeds in the lake to make informed decisions.
4. Dedicated staff should be recruited on priority for the management of the sanctuary.
5. Eco-tourism need to be promoted in accordance with the principles of responsible tourism.
6. Grasslands need to be developed for the wildlife by opening the canopy, under the guidance of experts.
7. Micro-plans need to be developed for the EDCs.

Evaluators
Shri Azam Zaidi, Former PCCF/ HoFF & CWLW, Government of West Bengal
Shri P. Krishna Mohan, Former APCCF (Wildlife) Odisha
Dr. Diwakar Sharma, Director, Programme Management, M&E, WWF-India, New Delhi
Dr. Bilal Habib, Scientist-E, WII

CHHATTISGARH

State of Chhhattisgarh has a network of 14 Protected Areas, comprising of three National Parks and 11 Wildlife Sanctuaries and covering about 4.95% of the total geographical area of the state. State falls in Biogeographic zone of Deccan Plateau with three provinces i.e Central Highlands, Chhota Nagpur Plateau and Eastern Highlands. Due to ongoing Naxalite problems in the area, field visit could not be undertaken in Pamed Buffalo WLS by the team members. However, the team could have very enriching interactions with the Wildlife Warden of the Sanctuary and few staff.

On the evaluation of management effectiveness of the Sarangarh-Gomardhasanctuary it is found that overall management of the protected areas in Chhattisgarh good. There is a healthy growth of habitat in the Sanctuary, the animals in the sanctuary are healthy well stocked. The management of the wildlife in the state is satisfactory. However, some suggestion is furnished for the consideration of the State Govt.:

1. Pamed Wildlife Sanctuary which is located in Eastern Highlands, forms a part of large Central Indian Landscape falling in the states of Chhattisgarh, Maharashtra and Odisha.
2. Looking at Pamed WLS, we are of the opinion that the frontline staff of the department is working in very difficult conditions. Therefore, Department should think of initiating a special package of incentives for the staff. Free field ration, special allowance parallel to project tiger areas, suitable education supports to the children of the staff, rewards and good service entries, etc could be some of the options.
3. Discussion with WTI members revealed that they have been contributing for the area in terms of basic research regarding inventories & status of species as well as monitoring. This need to be supported and encouraged. Simultaneously innovative ways of monitoring like landuse changes by remote sensing and some routine monitoring by existing staff/ local people should be explored to gather long-term information about major ecological trends.
4. Keeping in mind the field realities, some long- term community interventions may also be initiated for generating support to the area.
5. The management plan for this PA requires some appropriate improvements and approval of CWLW.
6. The management plan of the Sarangarh-Gomardhasanctuary should be prepared and works should be implemented according to the prescription given their in.
7. The conversion of two lane highway into four lane highway passing through Sarangarh-Gomardha WLS dividing the sanctuary in two halves, will have detrimental effect on the sanctuary, The state govt. Should take up the matter with NHAI to appropriately mitigate the problem by developing under passes at regular interval for easy movement of wildlife in the sanctuary.
8. Estimation of population of major species (census) should be taken up at regular interval.

9. Research studies of fauna and flora need to be taken for the assessment of palatable plant and habitat improvement on all the PAs.

10. Strengthening of staff with young and trained staff in protected areas should be taken up on priority basis.

11. There is need to have proper Eco-tourism policy for regulation of tourism in the sanctuaries particularly to promote tourism in the WLS

3. Gomardha (Sarangarh-Gomardha) Wildlife Sanctuary, Chhattisgarh
MEE Score- 66.67% (Good)

Management Strengths

1. The PA has a well-defined area with varied topography and vegetation.
2. The quality of the habitat is good. There is good tree cover with trees of different age groups, and ground flora is present.
3. The entire sanctuary has good connectivity with the nearby PAs, viz. Barnawapara, on the western side, and Debrigarh WLS, in Odisha, on the eastern side.
4. The PA has well distributed water bodies. There are perennial streams or *nullahs* and ponds.
5. The staff are young and well trained.
6. The locals support the PA management, and the EDCs co-operate with the management.

Management Weaknesses

1. There are 28 villages in and around the PA. Thirteen villages are inside in the sanctuary.
2. Weeds have invaded the grasslands in certain pockets.
3. The staff strength is weak. Against a sanctioned strength of 64 for the PA, the existing strength is 40, with many vacancies among the frontline staff.
4. The PA lacks research inputs. Even basic information about the biodiversity and the populations of the key species is missing.
5. The management plan has not been revised for 5 years even after the expiry of the last plan in 2013.
6. The PA is divided in two parts by a major highway, which is being upgraded from a two-lane highway to a four-lane highway.

Immediate Actionable Points

1. The management plan should be prepared and implemented at the earliest.
2. Research should be undertaken on priority to list the key species and estimate their populations so that the information can be fed into the management plan.
3. Eco-tourism needs to be promoted along with strengthening of basic infrastructure.
4. The PA needs to be sanitized free of plastics and other waste.
5. Conversion of the two-lane highway to four-lane should be appropriately mitigated with green infrastructure by providing adequate underpasses and/or overpasses for wildlife crossings.

<u>Evaluators</u>

Shri Azam Zaidi, Former PCCF/ HoFF & CWLW, Government of West Bengal
Shri P. Krishna Mohan, Former APCCF (Wildlife) Odisha
Dr. Diwakar Sharma, Director, Programme Management, M&E, WWF-India, New Delhi
Dr. Bilal Habib, Scientist-E, WII

4. Pamed Wildlife Sanctuary, Chhattisgarh
MEE Score- 40% (Fair)

Management Strengths

1. In spite of poor law and order conditions, the forest is still intact. It is connected to Indravati Tiger Reserve in Chhattisgarh, Tadoba Tiger Reserve, in Maharashtra, Udanti Tiger Reserve in Chhattisgarh, and Sunabeda Wildlife Sanctuary in Odisha. This forms one of the largest landscapes of conservation significance in central India.
2. The PA has significant future landscape conservation values as there are no pressures of visitors or major developmental projects.
3. In spite of Naxalite problems, the frontline staff still operate in the remote areas to carry out minimum management interventions.
4. In general, the local people support this forest.

Management Weaknesses

1. Access to the area is difficult because of the Naxalite problems.
2. The draft management plan has not been approved yet.
3. Because of the Naxal issues and difficulties of access, baseline research remains weak and no scientific planning and implementation can be carried out.
4. During the last 3 years no evidence of wild buffalo could be found, for which the sanctuary was well known.

Immediate Actionable Points

1. The draft management plan should be improved and approved.
2. All possible inventories need to be carried out using experts, local people and trained staff, keeping in mind the feasibility in the field.
3. To the extent possible, long-term community interventions may be initiated to ensure that the area receives local support.
4. As access to the area is difficult and monitoring of species as would be carried out normally is not feasible, innovative ways of monitoring could be explored. Monitoring land use changes using remote sensing technology and routine monitoring by the staff or local people are suggested. These forms of monitoring will provide some indications of ecological trends.
5. The field staff are working under extremely difficult conditions, and therefore a system of special incentives for them may be initiated. The forest department should also think of providing free rations to the field staff.

Evaluators
Dr. A.K. Bhardwaj, Former PCCF & HOFF, Govt. of Kerala
Dr. Ram Kumar, Manager & Project Head, Wildlife Trust of India
Dr. Udayan Borthakur, Head, Wildlife Genetics Division (WGD), Aaranyak
Dr. B.S. Adhikari, Scientist-F, WII

JHARKHAND

The state of Jharkhand has one National Park and 11 Wildlife Sanctuaries, covering about 2.74% of the total geographical area of the state. This Protected Area (PA) network forms part of two biogeographical zones i.e. Deccan Plateau and Gangetic Plains. Our team could cover three Protected Areas (PAs) of the state during the current MEE exercise. These include Parasnath, Topchanchi and Mahuadanr Wildlife Sanctuaries (WLSs). All these PAs form part

of Deccan Plateau. Based on our discussions with the staff and the field exercises, we have following suggestions for the state:

1. The Management Plans for Parasnath and Mahuadanr WLSs are in draft form. In the light of various dimensions of current management, these plans need to be upgraded and approved at the level of the Chief Wildlife Warden. As far as Topchanchi WLS is concerned, it has no management plan as on today. This need to be brought under approved management plan at the earliest.

2. Parasnath WS is a unique ecosystem with its ecological, religious and cultural values. It also has very important role for the surrounding human landscape in terms of ecosystem services, particularly water. The current pilgrimage management in this PA is adhoc leading to serious problems of pollution and habitat disturbance. These threats can be transformed into an opportunity for generating additional resources for the area through appropriate entry charges and other services. These resources will be critical for not only effective scientific management of the PA but also providing continued livelihood support and other development of the surrounding communities. We propose that a new decentralized institutional arrangement in the form of a Conservation-Development Trust or Foundation should be established for this PA so as to generate and efficiently manage the resources from pilgrimage and also address other ecological and people related issues.

3. Parasnath and Topchanchi WS are adjoining. In fact, Parasnath forms important catchment for Topchanci and adjoining landscape. These two PAs cannot be seen in isolation. It is, therefore, suggested that both these areas should be merged so as to provide integrated management to the entire landscape.

4. Staff strength and their capacities are a big managerial challenge for all the PAs. Therefore, effort should be made to provide adequate staff to these areas and also basic supportive training on different aspects of wildlife management and monitoring of major species should be provided. Special effort also needs to be made to sensitize the staff for dealing with ecodevelopment programmes and visitors. Both, Parasnath and Mahuadanr require additional technical staff like ecologists and sociologists for supporting the long-term monitoring programmes, looking after the pilgrimage/tourism aspects and ecodevelopment programmes.

5. Mahuadanr WS requires upgradation in terms of its administration. It is, therefore, suggested that this WLS be put under the charge of a senior forest officer of the rank of ACF, reporting to Field Director, Palamau. The area may be divided into two ranges and the range officers should be provided necessary staff and supportive infrastructure facilities.

6. In most of these PAs, the ecodevelopment programmes are very weak. Existing EDCs are almost dysfunct due to lack of resources, engagement as well as staff capacities. These issues need to be addressed on priority basis.

5. Mahuadanr Wildlife Sanctuary, Jharkhand

MEE Score- 60.83% (Good)

Management Strengths

1. This is an intact habitat for wolf in an agro-pastoral landscape supporting one of the largest breeding populations of this species in the country.
2. The sanctuary is contiguous with Palamau Tiger Reserve and has fragile connectivity with other PAs of Chhattisgarh, providing a large space for the periodic movements of species.
3. Due to recent management initiatives to establish EDCs, conduct awareness programmes and pay compensation to all victims of conflict, the support of communities has improved. This has also helped in controlling the Naxalite problem in the region to some extent.

Management Weaknesses

1. The sanctuary is quite neglected as most of the attention of the management is on Palamau Tiger Reserve.
2. The biotic pressures from the 25 villages around the sanctuary and the 62 villages in the buffer zone still continue.
3. The current ecodevelopment programme is weak. EDCs have been established, but the engagement with communities is not regular. The available funds are not adequate for running the EDCs efficiently. The funds are also not released in a timely manner. Also, there are no other sources of revenue generation that could provide additional livelihood support to the local communities. The Lodh waterfall, a tourist spot in the sanctuary, is not being managed effectively. Visitors come only out of their own interest.
4. The staff strength is inadequate, and their capacities are low. Most of the monitoring work is being carried out by daily wage staff with their traditional skills.
5. There is practically no effort to manage tourism. There is no mechanism for interpretation even at Lodh Falls, which is a natural attraction for tourists.
6. The existing system of monitoring and research is not scientific.

Immediate Actionable Points

1. The draft management plan needs to be finalized and duly approved at the level of the Chief Wildlife Warden.
2. The administrative structure of sanctuary needs to be upgraded for effective management. It is proposed that the sanctuary be put under the charge of one senior officer of the rank of an Assistant Conservator of Forests (ACF), reporting to the Field Director, Palamau. The sanctuary should be managed under two ranges. Accordingly, two Range Officers should be posted with their support field staff. This team should be provided the necessary accommodation and mobility infrastructure as well as other field equipment/gears.
3. One technical personnel (an ecologist) should be engaged exclusively for this sanctuary on a contractual basis using the resources of the Palamau Tiger Conservation Foundation. The ecologist should be given the responsibility of long-term monitoring of the wildlife and their habitats, conducting basic research to generate baseline data and attending to other related interface issues.
4. Both permanent and daily wage staff need initial and refresher training in wildlife management and other special skills required for monitoring Wolves. They also need to be trained to handle ecodevelopment and ecotourism programmes for the area.
5. The existing ecodevelopment programmes need a lot of strengthening. A system of continuous engagement with communities, capacity building, providing support for

alternate livelihoods, microplanning, etc. will go a long way to improve the existing ecodevelopment initiatives and thereby generate long-term local support for the PA.

6. Education and interpretation facilities need to be created and managed both at the sanctuary headquarters and at Lodh Falls, where visitor facilities and a small interpretation cum education centre are needed. Ecotourism could be promoted at this site through guides from local communities after they are trained appropriately.
7. The existing system of handling complaints will need to be strengthened. This will be needed particularly as more visitors start coming. The system can be in the form of complaint registers made available at Lodh Falls, at the sanctuary headquarters and at the range headquarters. An email address and a website can also be created for this purpose.
8. There are mining issues in the connectivity areas that need to be documented, understood better, monitored and mitigated.

Evaluators
Dr. A.K. Bhardwaj, Former PCCF & HOFF, Govt. of Kerala
Dr. Ram Kumar, Manager & Project Head, Wildlife Trust of India
Dr. Udayan Borthakur, Head, Wildlife Genetics Division (WGD), Aaranyak
Dr. B.S. Adhikari, Scientist-F, WII

6. Parasnath Wildlife Sanctuary, Jharkhand
MEE Score- 58.33% (Fair)

Management Strengths

1. The terrain of the sanctuary has hills and valleys at various altitudes surrounded by vast plains in an agro-rural landscape. Because of its unique location, geographical structure and associated religious/cultural values, vegetation is quite intact. These habitats support a diversity of mammals and a range of other associated species.
2. Because of good health of the forests, the sanctuary is valuable as a catchment. The area ensures availability of water perennially for the surrounding lower landscapes, thereby playing an important hydro-ecological role.
3. The religious and cultural values of the area attract large numbers of pilgrims, and therefore the sanctuary has great potential to generate resources that could be used to strengthen the scientific management of the sanctuary, providing supplemental livelihood opportunities to the surrounding communities and strengthening the support of the public in general.

Management Weaknesses

1. More than 50% of the sanctuary is not accessible due to the prevailing Naxalite problems.
2. Considering the range of management issues, such as protection, pilgrimage and community engagement, the staff strength is inadequate.
3. The pilgrimage is currently more or less unregulated, and this is leading to a growing problem of habitat disturbance and pollution due to plastics and other garbage.

Immediate Actionable Points

1. The baseline information of the sanctuary should be strengthened through rapid surveys and basic research. This should be used to put in place a new scientific system for long-term monitoring. This information should also be incorporated in the management plan and used to upgrade the strategies of the plan.
2. The sanctuary requires a well-planned pilgrimage management strategy and action plan. The pilgrimage, which is currently leading to problems of pollution and habitat disturbance, can be used as an opportunity to generate additional resources that could

be used effectively to strengthen the scientific management of the area and generate community support.

3. There is a large influx of people to the area because of its religious and cultural values. At the same time, the place also plays an important role in supporting the well-being of the rural communities of the surrounding areas. Considering the range of issues, the current management of the area is not sufficient. For intensive and integrated scientific management of the sanctuary, the forest department should consider establishing a new decentralized institutional arrangement at the PA level (Conservation–Development Trust or Foundation) to support the area. This will help not only in managing resources efficiently but also addressing other ecological and people-related issues.
4. Parasnath forms an important catchment of the adjoining Topchanchi Wildlife Sanctuary, and the two PAs cannot be seen in isolation. It is, therefore, suggested that both these areas be merged so that there is integrated management of the entire landscape and surrounding areas.
5. The sanctuary requires a well-planned interpretation and education plan. Therefore, a well-planned interpretation centre and associated visitor facilities need to be created. The area should also be developed into a centre of nature education.
6. The staff strength needs to be improved, and the staff need to be trained adequately. The training should focus particularly on understanding the ecological aspects (species and habitats) of the area, monitoring/ estimation techniques, pilgrimage management and community participation issues.

Evaluators
Dr. A.K. Bhardwaj, Former PCCF & HOFF, Govt. of Kerala
Dr. Ram Kumar, Manager & Project Head, Wildlife Trust of India
Dr. Udayan Borthakur, Head, Wildlife Genetics Division (WGD), Aaranyak
Dr. B.S. Adhikari, Scientist-F, WII

7. Topchanchi Wildlife Sanctuary, Jharkhand
MEE Score- 43.33% (Fair)

Management Strengths

1. This sanctuary provides space for populations of major mammalian species spilling over from the adjoining Parasnath Wildlife Sanctuary, which is a major watershed in this landscape.
2. In general, there is support from the local communities of the villages in the fringes of the sanctuary.
3. The water body constructed in the area attracts a number of migratory birds, and this is an Important Bird Area of the country.

Management Weaknesses

1. The baseline information is inadequate, and there is no management plan.
2. The sanctuary boundary is not properly demarcated on ground and is perforated due to presence of 12 villages and their agriculture lands along the periphery of the sanctuary. There are high biotic pressures on the sanctuary from these villages in the form of grazing, cutting and other resource use.
3. The staff strength is highly inadequate, and the capacity of the staff to manage a wildlife area is poor.
4. The reservoir, which is an important area of the sanctuary, is under the control of Mineral Area Development Authority (MADA).

Immediate Actionable Points

1. A management plan should be prepared for the sanctuary immediately. It should be based on scientific information and should be prepared through a participatory process.
2. The staff strength should be augmented, and the staff should be trained in wildlife management and monitoring using available modern technologies. The forest department can think of using the opportunities provided by ongoing training programmes at Wildlife Institute of India (WII) for officers of the rank of Range Officer and above.
3. Both Topchanchi and Parasnath are part of the same contiguous landscape. These two PAs can be merged into a single PA for effective and integrated management.
4. All the 14 existing EDCs need to be revived. Sufficient resources should be made available for better functioning of these EDCs.
5. Baseline information on ecological, socioeconomic and other attributes needs to be collected and a system of long-term monitoring be put in place.
6. Boundaries of the sanctuary should be verified and demarcated on the ground.

Evaluators
Dr. A.K. Bhardwaj, Former PCCF & HOFF, Govt. of Kerala
Dr. Ram Kumar, Manager & Project Head, Wildlife Trust of India
Dr. Udayan Borthakur, Head, Wildlife Genetics Division (WGD), Aaranyak
Dr. B.S. Adhikari, Scientist-F, WII

ODISHA

The state of Odisha has 2 National Parks (NP) and 18 Wildlife Sanctuaries (WS), covering about 5.11% of the total geographical area of the state. The state forms part of Deccan Peninsula biogeographical zone with three provinces and Gangetic Plains with one province. Our committee has carried out the exercise of MEE for five Protected Areas (PAs) i.e. Nandankanan, Kuldiha, Khalasuni, Sunabeda and Bhitarkanika WLS. Bhitarkanika also includes some part as a NP. Out of these, first four WLSs form the part of Deccan Peninsula and the last comes under Gangetic Plains. Based on our field exercises and interactions with the staff, we have following suggestions for the state:

1. While the NP area of Bhitarkanika is comparatively intact, many areas of the WLS are perforated due to presence of large number of villages and their associated activities. Some of these villages have grown into small townships. There are problems of expanding shrimp cultivation in fringe areas. This is an aquatic system with lot of seasonal fluctuations. Therefore, it is suggested that the boundaries of the PA should be rationalized based on scientific and realistic investigations.

2. Bhitarkanika ecosystem is also very unique and dynamic. It requires active support of local communities and other stakeholders for its effective management. Significant resources and efforts are needed for on-going ecodevelopment programmes, scientific monitoring, visitor management and conservation education. It is, therefore, suggested that a decentralized umbrella institution on the pattern of Tiger Conservation Foundation or Chilika Development Authority may be established for management of this important ecosystem in terms of resources, specialized staff, networking and public mobilization.

3. Except for Nandankanan, field staff shortage has been observed in all these PAs. Field staff also lacked adequate capacities to manage long-term monitoring and community programmes. Therefore, it is suggested to provide appropriate staff strengths and their basic trainings in different aspects of wildlife management.

4. Ecodevelopment programmes have been initiated but these are rudimentary. The engagement with the communities is opportunistic. Special effort needs to be made for strengthening these programmes by providing adequate resources and trained staff who could undertake trust building activities, micro-planning and livelihood generation programmes for overall protection of these areas.

5. Khalasuni WLS is an important PA, which is currently being managed as a part of territorial division. It is suggested that following reorganization may be done for the effective management of this area. A new division in name of Sambalpur Wildlife Division, comprising of Badrama range and Khalasuni range may be created. Similarly, Bamra Forest Division may be reorganized with three ranges i.e. Bamra, Kuchinda and Jamankira ranges as an independent territorial division.

6. For Kuldiha and Khalasuni WLSs, a systematic programme for building ecological and socio-economic baselines and long-term monitoring should be initiated.

7. Similarly, Sunabeda also requires a very proactive community engagement and a good beginning can be made by initiating community based ecotourism programmes at two of the important sites. Gradually the community engagement progress can be enhanced and strengthened.

8. Bhitarkanika Wildlife Sanctuary and National Park, Odisha
MEE Score- 70% (Good)

Management Strengths

1. Being a prestigious Protected Area of Odisha state, Bhitarkanika receives reasonable amounts of financial resources from the state and Centre. Funds from CAMPA are compensating the usual problems of shortages, if any, and late release of budgetary allocations. Further, the infrastructure, facilities and field equipment meet the current requirements adequately.
2. There is a comprehensive system of regular monitoring covering a range of species and habitats. Records are kept for these exercises adequately.
3. The protected area provides very good chances of sighting crocodiles. It supports habitats of rich mangrove diversity.
4. It is a large area with a habitat connectivity to Gahir Matha Wildlife Sanctuary and adjoining territorial forests. Thus, it is a unique model of a coastal and marine ecosystem extending over a large landscape and playing an important role of providing ecological and socio-cultural security.

Management Weaknesses

1. There is significant shortage of staff members at the forest guard and forester levels. This shortage is very acute at the level of Range Officer (one Range Officer is in place against a sanctioned strength of seven). There is also a need for some technical staff members to look after the issues of communities, scientific monitoring and visitor management.

2. The national park is intact. However, the wildlife sanctuary is perforated due to the presence of a large number of villages (about 410). There are heavy biotic pressures in the sanctuary due these villages, particularly because the system undergoes seasonal fluctuations.
3. The problem of large-scale shrimp culture and changing land use in the fringes of the sanctuary and beyond is a big threat to the future ecological security of this PA.
4. Pollution of rivers upstream, e.g. the Brahmini, due to activities such as mining is another challenge to the long-term integrity of this unique system.

Immediate Actionable Points

1. The PA, particularly the wildlife sanctuary, is perforated due to the presence of a large number of villages and their associated activities. Over the time, some of these villages have grown into small townships. There are new problems of expanding shrimp culture in the fringe areas. There are seasonal fluctuations in the aquatic system. Therefore, there is a need to rationalize the boundaries of this PA on the basis of a scientific and realistic investigation.
2. This is a unique and versatile ecosystem that will require the support of local communities and a range of stakeholders for effective management. Resources and significant efforts will be needed to strengthen the livelihood opportunities of local communities through an ecodevelopment programme and management of the larger issues of conservation and development. Scientific monitoring, visitor management and conservation education are other important aspects of management for which services of specialized technical staff members (other than the regular protection staff) are required. Therefore, the MEE Committee suggests that an umbrella institution on the lines of Tiger Conservation Foundations or Chilika Development Authority may be established to manage this large ecosystem.
3. A lot of research and monitoring information is available, but it is all scattered. All this information may be consolidated and documented. This documentation can then be used as a baseline to create a computerized system for long-term scientific monitoring and for influencing management actions.
4. There is a need to undertake a systematic assessment of threats while preparing the new management plan. The revised plan should address all these threats through specific mitigation strategies of zone/theme plans.
5. There is an acute shortage of staff members. The vacant positions among the field staff should be filled immediately.
6. The current ecodevelopment programme is weak. Only a few EDCs, related to ecotourism, are functional. There is a need to revive the defunct EDCs and establish a few more in prioritized villages. This will require investment in terms of trust building activities, microplanning, capacity building and livelihood programmes.
7. The publicity material is stale and inadequate. More material in the form of brochures, stickers and booklets needs to be designed. A PA-level website will go a long way in reaching out to the public. A new interpretation centre should be created at the earliest using modern know-how and information. Modern technology should be used to reach out to the public to the extent possible.

<u>Evaluators</u>

Dr. A.K. Bhardwaj, Former PCCF & HOFF, Govt. of Kerala
Dr. Ram Kumar, Manager & Project Head, Wildlife Trust of India
Dr. Udayan Borthakur, Head, Wildlife Genetics Division (WGD), Aaranyak
Dr. B.S. Adhikari, Scientist-F, WII

9. Khalasuni Wildlife Sanctuary, Odisha

MEE Score- 70.83% (Good)

Management Strengths

1. This PA is protected from all sides by adjoining forest divisions, and a buffer area is being created by including more forests as proposed reserve forests (PRFs). The number of staff members is limited, but some of them have been trained to use a system of PDAs. PDA-based smart patrolling is being carried out in the sanctuary and this permits monitoring of the movement of the frontline staff by higher officials. A system of daily beat and periodic joint patrolling is in place, with a team of about 50 daily wager watchers and the available frontline staff.
2. There is only one village, with three families, inside the PA, and this is also being relocated. Therefore, there is practically minimal pressure in the core area. There are 38 villages within a radius of 5 km of the sanctuary, but the biotic pressures from these are being contained in the buffer zone.
3. Most of the habitat is intact, without much infestation with invasive species, and there is practically no tourism pressure.

Management Weaknesses

1. The PA is being developed. For effective scientific management, the available baseline information needs to be strengthened through rapid surveys and research.
2. During summer, some of the areas are dry and there is a problem of fires. Also, some areas face shortages of water during the summer.
3. Few training programmes have been carried out at the PA level. However, the frontline staff lacks formal training on wildlife monitoring and management. Community participation is opportunistic, and the level of participation has been very low both during planning and implementation.

Immediate Actionable Points

1. The ecological and socioeconomic baselines of Khalasuni WLS need to be strengthened through basic research and rapid surveys, using the services of local institutions and NGOs. A simple but comprehensive system of monitoring needs to be developed and systematic monitoring needs to be initiated to understand the ecological and management trends and to take appropriate management decisions.
2. Wildlife training programmes need to be carried out for the field staff after carrying out a proper training need assessment. Similarly, the officers also need to be trained in wildlife management. The forest department can make use of the diploma and certificate programmes of WII to train them. As the management of the buffer zone is currently evolving, training the respective staff members in participatory techniques, microplanning and other aspects of ecodevelopment will be crucial.
3. The level of community participation has been low, and it needs to be strengthened through continuous engagement with the EDCs. Institution building, raising awareness and providing alternative livelihood support need to be carried out through the ongoing Joint Forest Management and Ecodevelopment Programme. Involvement of local NGOs could also be sought to maintain the perpetuity of these initiatives.
4. Due to dual responsibility of territorial and wildlife areas, the DFO is not able to give his full attention to this PA, where the management is evolving. It will be appropriate to create a separate wildlife division consisting of Khalasuni and Badarmah wildlife sanctuaries for effective management. The territorial areas of the current wildlife division could be added to the adjoining territorial divisions.

Evaluators

Dr. A.K. Bhardwaj, Former PCCF & HOFF, Govt. of Kerala

Dr. Ram Kumar, Manager & Project Head, Wildlife Trust of India
Dr. Udayan Borthakur, Head, Wildlife Genetics Division (WGD), Aaranyak
Dr. B.S. Adhikari, Scientist-F, WII

10. Kuldiha Wildlife Sanctuary, Odisha

MEE Score- 64.17% (Good)

Management Strengths

1. This sanctuary has an intact tract of multi-storey forest spread over undulating and hilly terrain, providing a spectrum of habitats. It has perforated linkages with adjoining forests up to Similipal Tiger Reserve.
2. The sanctuary has adequate frontline staff strength and a group of daily wage staff. As the PA is being developed, the department has provided adequate financial resources from CAMPA for developmental works.
3. There is a well maintained and extensive network of roads within the sanctuary which is responsible for enhanced mobility for field staff and tourists. Systematic soil and water conservation initiatives have been initiated in different parts of the PA.
4. The area has very low biotic pressures inside as there are very few human habitations inside the sanctuary.

Management Weaknesses

1. Even though there are very few habitations inside, there are lot of pressures in the buffer zone due to large number of villages in it. Simultaneously, there is weak community engagement in the buffer zone as most of the Joint Forest Management Committees (JFMCs) are defunct.
2. Even though the area has a tremendous potential as a spillover area, the habitat is fragmented and perforated, and the connectivity with the adjoining landscape of Similipal is fragile.
3. Fringe areas of the sanctuary have biotic pressures in the form of grazing and firewood and NTFP collection. There are also occasional incidences of poaching.

Immediate Actionable Points

1. Some basic infrastructure has been created for tourists. However, there is a need to further improve the facilities to attract more visitors. An interpretation centre and well trained local guides are also required to improve the wildlife tourism.
2. Five EDCs have been established, and a few members from these are being involved in protection and tourism. However, the current engagement with the local communities is minimal. The existing ecodevelopment programmes need to be strengthened, and this requires more resources and efforts.
3. The research and monitoring programmes need to be strengthened along with supportive mechanisms to improve the baseline data to understand the impacts of management actions.
4. The existing management plan is not very detailed. It requires improvements in terms of assessment of threats, management strategies, capacity building programmes and community engagement.
5. More vehicles and field gears are needed for the staff for effective protection. The staff need to be trained in wildlife management urgently. The forest department may like to make use of the ongoing wildlife training courses at WII for building the capacity of the officers of the PA.
6. A corridor restoration programme may be planned and implemented to restore the ecological connectivity of the area with the larger Similipal landscape.

7. The remaining villages in the core zone may be relocated on priority basis, and the vacated areas may be developed as grasslands and water holes for animals.

Evaluators
Dr. A.K. Bhardwaj, Former PCCF & HOFF, Govt. of Kerala
Dr. Ram Kumar, Manager & Project Head, Wildlife Trust of India
Dr. Udayan Borthakur, Head, Wildlife Genetics Division (WGD), Aaranyak
Dr. B.S. Adhikari, Scientist-F, WII

11. Nandankanan Wildlife Sanctuary, Odisha
MEE Score- 79.17% (Very Good)

Management Strengths

1. This PA is located just about 17 km from Bhubaneswar, the state capital of Odisha. Bhubaneswar being gateway for tourists visiting Odisha, Nandankanan is an important destination for large numbers of visitors throughout the year. The sanctuary primarily harbours an important zoo and ex-situ conservation facility of the country, which serves as a major attraction for the visitors.
2. The annual income of the PA is about Rs.18 crores. Every year the PA saves about 50% of the income after all expenses. Therefore, the PA is very strong financially and protected against any financial inflation. The money is managed through a society, which provides the added advantage of decentralized management and quick decisions.
3. The PA has well-established infrastructure for management of animals and for the use of visitors and the supporting staff.
4. Because Nandankanan is an old and prestigious area of the state, there is a lot of support from the public as well as the government.
5. There are adequate number of technically competent and experienced staff members, both old and new. Technical support is also available from Odisha Veterinary College (Centre for wildlife health headed by a coordinator)
6. There are multiple opportunities for engagements for the visitors and this is one of the largest zoos of India.
7. The zoo also supports conservation breeding programmes for the Gharial, Pangolin, Crocodile, Water Monitor Lizard and White Tiger.
8. Being small and with walled boundaries, the area is protected quite well. This is also because the staff strength is adequate.

Management Weaknesses

1. There is one road inside the zoo. This goes around the water body, which is being used as a thoroughfare by people from adjoining villages. As a result, there are problems of garbage and disturbance.
2. The outlet channel of the water body inside the zoo needs maintenance.
3. The habitat of the wilderness zone is facing a problem of invasive species.
4. This is a large zoo, and a lot of waste is generated every day. However, there is no specific garbage disposal place for the zoo.
5. Many of the field staff are not adequately trained in wildlife management.

Immediate Actionable Points

1. The road inside the zoo is being used as a thoroughfare by communities. This need to be stopped or regulated after a dialogue with the local communities and panchayats.
2. The outlet channel of the water body needs to be repaired.
3. Steps should be taken to manage invasive species in the wilderness zone actively.

4. As the populations of native species are increasing, possibilities of establishing connections with the adjoining forest landscape of Chandrika Wildlife Sanctuary should be explored. The population of herbivores in the wilderness zone is increasing. Therefore, steps need to be taken to manage this population to avoid future human–wildlife conflict.
5. The technical wing needs to be strengthened and the ongoing conservation breeding programmes need to be modernized.
6. Wildlife and other specific training programmes may be organized for the field staff, including Group C and Group D.

Evaluators
Dr. A.K. Bhardwaj, Former PCCF & HOFF, Govt. of Kerala
Dr. Ram Kumar, Manager & Project Head, Wildlife Trust of India
Dr. Udayan Borthakur, Head, Wildlife Genetics Division (WGD), Aaranyak
Dr. B.S. Adhikari, Scientist-F, WII

12. Sunabeda Wildlife Sanctuary, Odisha
MEE Score- 61.67% (Good)

Management Strengths

1. Even though most parts of this sanctuary were not fully accessible in the recent past due to Naxalite problems, the integrity of the forest is still intact. With the current trends of management interventions, degraded habitats can be improved.
2. The sanctuary is part of a larger landscape, with connectivity to Udanti Sitanadi Tiger Reserve, Khariar Territorial Division and Raipur East Territorial Division. Thus, it offers a good habitat for Tigers and other associated species spilling over from these areas.
3. The waterfalls and unique sites of the sanctuary offer opportunities for ecotourism and interpretation, thereby providing scope for attracting visitors on the one hand and offering livelihoods to local communities on the other hand.
4. In spite of the Naxalite problems in the area, the staff continue to move around in the sanctuary.

Management Weaknesses

1. The protection is still weak because the movements of the staff are inhibited at night due to the Naxalite problems. In many places the infrastructure has been damaged by the Naxalites.
2. The biotic pressures from villages, both inside the sanctuary and in the fringes, are high. This has led to degradation of habitats due to the spread of weeds such as *Eupatorium*.
3. The participation of communities in the management of the sanctuary is weak due to weak focus on ecodevelopment programmes.
4. The baseline information is weak, and monitoring is not regular.

Immediate Actionable Points

1. The processes of community participation need to be strengthened by systematically reviving the existing EDCs and establishing a few new ones. This will require an intensive process of trust building, capacity enhancement and institution building and will lead to supplemental livelihoods. The management is also planning to initiate ecotourism programmes at a few sites. These initiatives should also be used to provide livelihood opportunities to some members of nearby EDCs and generate local support for the PA.

2. Already a proposal is being considered by the state government to elevate the status of this area to a Tiger Reserve. This matter should be pursued so that the final orders of the state government are obtained. Declaring this area a Tiger Reserve can open up new opportunities of development for the area.
3. The habitat improvement programmes need to be strengthened by enhancing the resources and efforts. Areas currently infested with weeds can be developed into grasslands, which could support larger herbivore populations. A systematic long-term monitoring programme also needs to be established for these habitats.
4. The ecological and socioeconomic baselines of the sanctuary need to be strengthened through rapid surveys, research and regular monitoring.
5. There are significant number of vacancies in the staff positions. These need to be filled. Simultaneously, a systematic process of training of staff members needs to be initiated using professional institutions of the state and central institutions. The forest department can avail the opportunities of the regular Certificate and PG Diploma Course training programmes at WII to train its officers.

Evaluators
Dr. A.K. Bhardwaj, Former PCCF & HOFF, Govt. of Kerala
Dr. Ram Kumar, Manager & Project Head, Wildlife Trust of India
Dr. Udayan Borthakur, Head, Wildlife Genetics Division (WGD), Aaranyak
Dr. B.S. Adhikari, Scientist-F, WII

WEST BENGAL

On the evaluation of management effectiveness of the four sanctuaries of West Bengal, it is evident that overall management of the protected areas in West Bengal well organised, the effect of which is well reflected in the field. There is a healthy growth of habitat in the PAs, as a result population of the flagship species of the sanctuaries have increased in last 20-25 years. The management of the wildlife in the state is satisfactory. However, some suggestion is furnished for the consideration of the State Govt.:

1. There is need of taking up the matter of reducing the speed of trains passing through the Mahananda WLS and Jaldapara WLS as per the High court order.

2. The state Govt should file an IA in WP 202/1996 in the Hon'ble Supreme Court for conversion of the monoculture of Teak plantation in the protected areas with the indigenous species suitable for the wildlife habitat.

3. Research studies of fauna and flora as well as water bodies need to be taken for the assessment of palatable plant and habitat improvement on all the PAs.

4. In Kulik Sanctuary at Raiganj lake in only one third of the area is utilised as the bird sanctuary. The remaining unutilised area of park may be utilised by introduction of deer such as Chital and Sambhar and rodents like Hare, rabbit, porcupine etc. to make the sanctuary more attractive for the tourists.

5. Strengthening of staff with young and trained staff in protected areas should be taken up on priority basis.

6. Estimation of population of major species (census) should be taken up at regular interval.

13. HalidayWildlife Sanctuary, West Bengal
MEE Score- 77.27% (Very Good)

Management Strengths

1. Haliday Island is a transitional ecotone that supports a unique and diverse flora and fauna—mangrove forests and a littoral or supra-littoral forest floral–faunal assemblage within the smallest island (5.95 km^2) of the Sundarbans.
2. It provides shelter and protection to various species of wildlife, particularly birds, included those listed in the Red Data Book (R.D.B.) of the IUCN and the appendices of CITES. Besides, the wildlife sanctuary is visited by a number of animals of Schedule-I of the Wildlife (Protection) Act 1972, including the Gangetic Dolphin, Estuarine Crocodile, Fishing Cat and Tiger.
3. Haliday Island is a small, remote island of the Sundarbans. It is a protected area bounded by the river Matla and the Bay of Bengal on the south. It is well protected from external threats such as illicit felling, poaching and encroachment since villagers do not have easy access to the protected area.
4. Training has been imparted regularly to the division on legal aspects, the use of arms and tranquilising.
5. The forest department has good co-ordination with the animal resource development department of the protected area.

Management Weaknesses

1. Potable water is not available on Haliday Island. Wildlife is solely dependent on estuarine water.
2. A large number of mechanised boats and launches contribute to the chemical pollution of the mangrove ecosystem.
3. There is no inter-agency co-ordination and co-operation between various departments such as the tourism, forest, I&CA and education departments with regard to development of tourism.
4. The infrastructure is inadequate. There is no permanent camp on Haliday Island. Patrolling is carried out by the staff of Kalash Camp, of this area.
5. Abiotic factors such as cyclones, of varying intensity, usually accompanied by tidal waves, cause damage to the area, including soil erosion of the land facing the sea.
6. The banks of the river Matla and the coastal area are getting continuously eroded, and a portion of the land is being lost every year.
7. The staff have not been imparted training in monitoring and in technical aspects of natural resource management and eco-tourism.

Immediate Actionable Points

1. One watchtower is needed to improve the surveillance in the PA.
2. It is essential to dig a few fresh water bodies at suitable locations to conserve water for the wild animals.
3. A palisade with aporcupine structure of bamboo piling will be an effective measure to arrest soil erosion**.**
4. In some places, specifically on the western side of the PA, embankment protection work of constructing spurs, RCC walls, etc. will be effective in controlling soil erosion.
5. Specialised training specific to PA management and eco-tourism should be imparted to the staff.

Evaluators
Shri Azam Zaidi, Former PCCF/ HoFF & CWLW, Government of West Bengal
Shri P. Krishna Mohan, Former APCCF (Wildlife) Odisha

Dr. Diwakar Sharma, Director, Programme Management, M&E, WWF-India, New Delhi
Dr. Bilal Habib, Scientist-E, WII

14. Jaldapara National Park, West Bengal
MEE Score- 80.83% (Very Good)

Management Strengths

1. Jaldapara has a great success story of conservation. There were only 14 rhinoceroses in 1985, and the number has increased to 204 in 2015.
2. The national park has an inviolate wildlife zone devoid of any human settlements.
3. The rich diversity of the park's fauna and flora reflects a healthy ecosystem.
4. The savannah grassland provides an excellent habitat for the rhinos and other herbivores.
5. There is no dearth of water due to the perennial system of the river Torsa.
6. The park is a connecting link between other protected areas, viz. Buxa Tiger Reserve and Gorumara National Park. It is a part of the Eastern Dooars Elephant Reserve.
7. Park infrastructure have been developed well, and the staff are motivated.
8. A good number of elephants are available for protection duty.
9. There is a good network of watchtowers and protection camps.
10. The eco-development committees are very alert and aware, acting as social fencing.
11. The eco-tourism is well organised, and local members of the EDCs are engaged as guides for jungle safaris. The JFMC members who benefit economically get a 40% share of the revenue generated from eco-tourism.

Management Weaknesses

1. The trouser-like shape of the park, with human habitations along close proximity of the park boundary, is a matter of concern for the management.
2. There is a high-density human population around the PA. There are two village enclaves within it and 30 villages in the fringe areas. Thus the PA is always prone to man–animal conflict.
3. The "chicken neck" makes the boundary of the PA very porous. The easy access across the entire length of the boundary poses a threat of poaching of wildlife, especially of rhinoceros and elephant.
4. The dependence of people on the forest for sustenance, viz. firewood, NTFP and fodder, and the grazing pressure of village cattle on the PA may result in habitat destruction.
5. Some areas of the PA are highly fire-prone. Constant vigilance is required.
6. The staff are old and untrained. There are few permanent mahouts or grass cutters.
7. The park is infested with weeds, and the habitat has been degraded.
8. This national park is bisected by LRPNH 31C and a railway line, making the wildlife vulnerable to accidents.
9. There is dolomite deposition in the rivers from Bhutan.

Immediate Actionable Points

1. Immediate steps need to be taken to augment the staff with young and energetic persons.
2. Presently the boundary of the PA is porous. Access points have been created by the villagers. All these illegal entry points should be closed with gate, or the boundary must be cut by digging trenches.
3. Patrolling using smart technologies such as MSTrIPES should be strengthened to regularly monitor illegal encroachments and anthropogenic activities within the park.
4. Wild animals crossing the roads and straying into the fields are often hit by vehicles travelling at high speeds. So initiatives such as constructing speed breakers, imposing traffic bans etc. must be taken to slow down the speed on LRP NH 31C during those hours when the animal crossing is maximum.

5. Two enclave villages need to be relocated and the extent of the habitat increased.
6. As Jaldapara forms a connecting links with other PAs, corridor management is required within the tea gardens and army establishments to ensure that there is uninterrupted connectivity with the other PAs in the landscape.
7. Research on key issues relating to the biodiversity, population dynamics of key animals and habitat management should be taken up on a priority basis.
8. The vacancies in the staff should be filled up with trained and energetic members of the local population.
9. The sections of the railway track and highway within the sanctuary should be monitored regularly by the staff. Signage indicating that the area is a wildlife/elephant crossing zone and indicating the speed limits should be provided at regular intervals along the railway line and highway.

Evaluators
Shri Azam Zaidi, Former PCCF/ HoFF & CWLW, Government of West Bengal
Shri P. Krishna Mohan, Former APCCF (Wildlife) Odisha
Dr. Diwakar Sharma, Director, Programme Management, M&E, WWF-India, New Delhi
Dr. Bilal Habib, Scientist-E, WII

15. Mahananda Wildlife Sanctuary, West Bengal
MEE Score- 71.67% (Good)

Management Strengths
1. Mahananda Wildlife Sanctuary is compact and has fairly good access by road. The sanctuary is close to Siliguri town.
2. The sanctuary has good wildlife habitat and has a well-defined natural boundary. Focused actions can contribute towards improving the status of the wildlife in the sanctuary.
3. The practice of involving local village youth in anti-poaching patrolling teams is a very innovative and effective protection measure.
4. The staff placement of the sanctuary is satisfactory.
5. The water supply in the sanctuary is very good as the perennial river Mahananda flows through it. As such, the animals face no shortage of drinking water.
6. The vegetation inside the sanctuary area is well stocked. Natural regeneration is taking place, and the forest department has taken steps to develop fodder plantations and to fill gaps inside the sanctuary as and where required.
7. The eco-development committees are very effective and support the forest department with the protection and development activities of the sanctuary.

Management Weaknesses
1. The sanctuary is fringed by tea gardens and revenue villages on all sides except the northern fringe. There are as many as 56 *mouzas*, having a total human population of about 50,000, that are dependent on the sanctuary.
2. There is Illicit grazing of cattle and lopping of trees for fodder, head-loading/van-loading of fuelwood for sale in rural and urban areas, felling and removal of timber for conversion by sawmills, veneering furniture making units, illicit collection of minor forest produce, boulder collection, etc.
3. The drying up of some of the *jhoras* and streams during the dry months from January to April, which typically results in migration of the animals from the dry zones into wetter areas and in the congregation of the animals in a few localised pockets.
4. Because of cattle populations in the proximity, the sanctuary is vulnerable to the spread of cattle-borne diseases such as anthrax and Foot and Mouth Disease (FMD).

5. The primary reason for man–animal conflicts in the sanctuary is the straying of wild Elephants into habitations during the seasons when agricultural crops are grown. The elephants enter the villages, in herds, as solitary animals or in *maljuria* groups, for crop-raiding. In the process, sometimes villagers get killed accidentally and large areas of crops get devastated. Damages to huts is more common during the post-harvest season, during which the elephants raid the houses for paddy and maize.
6. The number of trains plying within the sanctuary has considerably increased after the conversion of the metre gauge line into a broad gauge line. On an average, about 25–30 trains pass through the core area of the sanctuary from Gulma to Sevoke at high speeds. The wild animals are highly vulnerable to accidents caused by these speedy trains.
7. National Highway (NH) 31, which passes through the sanctuary area from 7th Mile to Sevoke bazaar also poses a considerable threat to the wildlife, especially small herbivores such as the spotted deer, barking deer, wild pig and hare. Mortalities of elephant calves have also been observed occasionally due to vehicle hit.
8. Monocultures of teak are common in the plain areas of Mahananda Wildlife Sanctuary. They are distributed over a large area of the sanctuary.

Immediate Actionable Points

1. The staff should monitor the railway track within the sanctuary regularly. Signage mentioning that the area is a wildlife/elephant crossing zone and displaying the speed limits should be affixed at regular intervals along the railway track. The railway department should be persuaded to adhere to the directives of the Honble' High Court regarding the speed limits (20–30 km/hour) of the trains passing through the sanctuary.
2. Speed breakers should be constructed at regular intervals and especially at wildlife crossing zones on the national highway. The vehicles plying on the highway should not be allowed to cross the speed limit of 30 km/hour.
3. Besides providing livelihoods, some support activities should also be taken up in the villages to garner the confidence of the villagers.
4. The sanctuary is very close to Siliguri town. Therefore, eco-tourism needs to be promoted by creating the facilities needed by visitors. It is recommended that awareness campaigns be planned in consultation with local communities and implemented in a phased manner.
5. The concept of developing home-stays could be promoted around the sanctuary. The hospitality facilities may include eco-tourism camps and catering, accommodation and camping services managed by the local communities.
6. A census of the major animal species needs to be taken up on a regular basis.
7. Interactive computerised consoles need to be introduced in the nature interpretation centre to increase public awareness regarding nature conservation, to create concern for the endangered flora, fauna and eco-systems and to motivate the people to conserve nature in general and protect the PA in particular.
8. The forest department should take up the matter of monocultures by filing an Interlocutory Application (IA) in the Hon'ble Supreme Court for removal of the teak plantation in the PA.

Evaluators

Shri Azam Zaidi, Former PCCF/ HoFF & CWLW, Government of West Bengal

Shri P. Krishna Mohan, Former APCCF (Wildlife) Odisha

Dr. Diwakar Sharma, Director, Programme Management, M&E, WWF-India, New Delhi
Dr. Bilal Habib, Scientist-E, WII

16. Raiganj Wildlife Sanctuary, West Bengal
MEE Score- 81.03% (Very Good)

Management Strengths

1. This is a well-protected wildlife sanctuary. It is considered a paradise for migratory birds.
2. It is located in the heart of Raiganj town, and it is easily accessible by bird lovers.
3. The people of the town, local NGOs and the tourism department of the state government support the forest department in the maintenance and development of the sanctuary.
4. The sanctuary has a good and perennial source of water from the river Kulik.
5. A wetland is being added to the sanctuary. This will help increase the extent of the bird habitat.
6. A butterfly park is being developed. This will increase the importance of the sanctuary for tourists and the students of the town.

Management Weaknesses

1. The sanctuary has an extent of just 1.3 km^2. This area is surrounded by thickly populated villages. Cattle grazing could be one of the threats faced by the sanctuary, damaging younger plants.
2. A large part of the sanctuary is of no use as the main bird concentration is confined to one-third of the area the sanctuary.
3. The people living on the fringes of the sanctuary, especially the youth, cause disturbances to the bird as some of them do not like the smell produced by it.
4. After erection of fencing entry to the sanctuary has become restricted. Local people sometime do damage the fencing after this restriction.
5. National Highway 34 passes through the sanctuary. The breeding behaviour of the birds is adversely affected by the movement of vehicles on this highway.
6. Eco-tourism is not well developed because the staff are not trained and there is little awareness among the tourists. It is seen that most of the tourists are inclined to use this sanctuary as an amusement park.
7. Cleaning the sanctuary during June–September is cumbersome but essential to maintain the hygiene of the area.

Immediate Actionable Points

1. The fencing must be maintained and the sanctuary should be cleaned to maintain hygiene.
2. Water Hyacinth and other floating vegetation must be removed periodically to maintain the biological oxygen demand, temperature and plankton diversity.
3. A continuous vigil need to be kept so that dos and don'ts of the sanctuary are strictly adhered to by the tourists.
4. Some herbivores, particularly spotted deer, sambar and hare, need to be introduced to the area to help habitat management. However, this will require thorough understanding of habitat requirements and resource availability in the area.
5. The pH level of the water needs to be maintained to increase the populations of the ampullariids and bivalves, which form the staple food of the Asian Openbill.
6. Basic research on and periodic monitoring of the water quality, biological oxygen demand, etc. are needed to assess the energy flow in the aquatic ecosystem.
7. Fingerlings (after proper species selection) must be released to ensure that there is enough food for the egrets, herons and other aquatic birds.

8. More features are to be added to the nature interpretation centre, and there needs to be an awareness programme for the tourists.
9. Socio-economic development of the EDC members and people living on the fringes of the sanctuary is needed to reduce the pressure on the sanctuary and to make them aware of the effect of tourism on their economic development.
10. The staff need to be given wildlife and eco-tourism training.
11. Good posters and banners must be put up to create awareness among the visitors.

Evaluators
Shri Azam Zaidi, Former PCCF/ HoFF & CWLW, Government of West Bengal
Shri P. Krishna Mohan, Former APCCF (Wildlife) Odisha
Dr. Diwakar Sharma, Director, Programme Management, M&E, WWF-India, New Delhi
Dr. Bilal Habib, Scientist-E, WII

17. Sajnakhali WLS, West Bengal

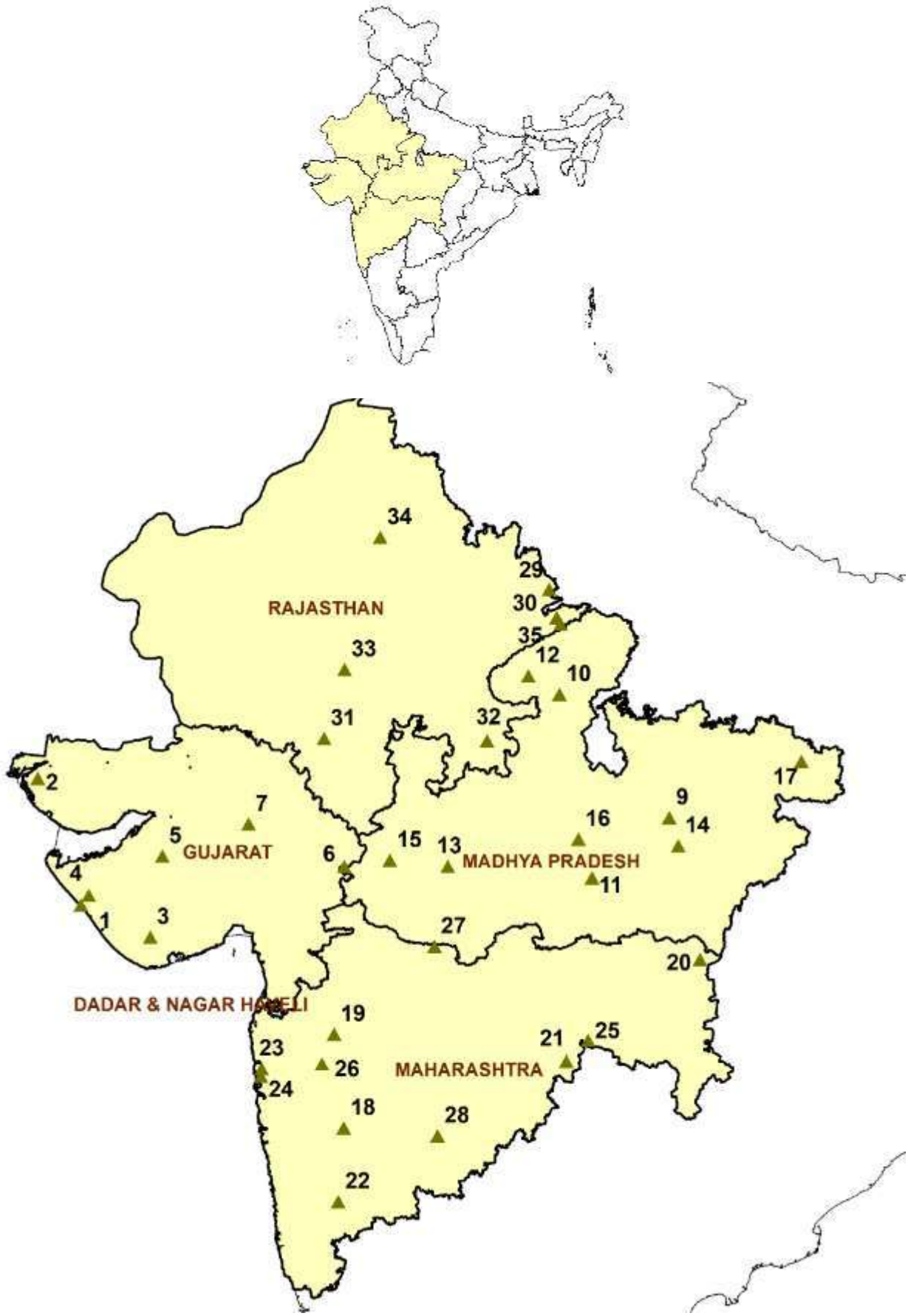
Not evaluated, as part of Sundarban Tiger Reserve

Evaluators
Shri Azam Zaidi, Former PCCF/ HoFF & CWLW, Government of West Bengal
Shri P. Krishna Mohan, Former APCCF (Wildlife) Odisha
Dr. Diwakar Sharma, Director, Programme Management, M&E, WWF-India, New Delhi
Dr. Bilal Habib, Scientist-E, WII

WESTERN REGION

3.4 WESTERN REGION

PA ID	Name of NP&WLS	State
1	Barda WLS	Gujarat
2	Narayan Sarovar Chinkara WLS	Gujarat
3	Paniya WLS	Gujarat
4	Porbandar Bird WLS	Gujarat
5	Rampara Vidi WLS	Gujarat
6	Ratanmahal Sloth Bear WLS	Gujarat
7	Thol Lake WLS	Gujarat
8	Pitti (Bird Island) WLS	Lakshadweep
9	Kuno WLS	Madhya Pradesh
10	Madhav NP	Madhya Pradesh
11	Pachmarhi WLS	Madhya Pradesh
12	Ralamandal WLS	Madhya Pradesh
13	Sailana WLS	Madhya Pradesh
14	Sardarpur WLS	Madhya Pradesh
15	Singhori WLS	Madhya Pradesh
16	Son Gharial WLS	Madhya Pradesh
17	Veerangna Durgavati WLS	Madhya Pradesh
18	Mayureswar Supe WLS	Maharashtra
19	Naigaon Peacock WLS	Maharashtra
20	Nandur Madhameshwar WLS	Maharashtra
21	Painganga WLS	Maharashtra
22	Sagareshwar WLS	Maharashtra
23	Sanjay Gandhi NP	Maharashtra
24	Thane Creek Flamingo WLS	Maharashtra
25	Tipeshwar WLS	Maharashtra
26	Tungareshwar WLS	Maharashtra
27	Yawal WLS	Maharashtra
28	Yedsi Ramlin Ghat WLS	Maharashtra
29	Keoladeo Ghana NP	Rajasthan
30	Ramsagar WLS	Rajasthan
31	Sajjangarh WLS	Rajasthan
32	Shergarh WLS	Rajasthan
33	Tal Chhapar WLS	Rajasthan
34	Todgarh Raoli WLS	Rajasthan
35	Van Vihar WLS	Rajasthan


RAJASTHAN
GUJARAT
MADHYA PRADESH
MAHARASHTRA
DADAR & NAGAR HAVELI
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GUJARAT

One of the MEE Team of Western Region carried out MEE of 7 NP&WLS. The detailed report of each NP&WLS discussed separately. The specific recommendations in brief are given below:

1. **Barda Wildlife Sanctuary:** This sanctuary has been notified under Section 18 of the Wildlife Protection Act, 1972 by the State Government on 12.02.1979. However, the process of settlement of rights is yet to be completed. The State Government should be requested to expedite the process of settlement of rights in the sanctuary and issue final notification under Section 26 of the Wildlife Protection Act, 1972. It will reduce incidence of uncontrolled grazing by cattle inside the sanctuary.

2. **Narayan Sarovar Wildlife Sanctuary:** Although the sanctuary has been notified under the Section 18 (Intention to declare the area as a wildlife sanctuary) in 1981 itself, the rights of the villagers have not been settled yet. The rights of villagers should be completed and settled expeditiously and the final notification of the sanctuary, under Section 26 of the WLP Act, 1972 should be issued expeditiously.

3. **Pania Wildlife Sanctuary:** Declaration of eco sensitive zone (ESZ) of the sanctuary is still pending with the Ministry. The Ministry may expedite the process of declaration of ESZ.Central Zoo Authority norms should be followed for captive breeding center for lions, and other animals for release into the wild. Ministry may coordinate between the Chief Wildlife Warden, Gujarat and Central Zoo Authority to address this issue.

4. **Porbandar Bird Sanctuary**: Satellite wetlands of the sanctuary, namely Gosabara-Mokrasagar, Chhaya Runn, Kuchhadi, Javar, Subhashnagar, Bardasagar and Mendha Creek have a richer bird diversity than Porbandar Sanctuary. The State Government may be requested to bring these areas within the ambit of the sanctuary or should be declared as community reserve.There is a rescue center for birds and animals inside the sanctuary. It is suggested that the rescue center should be shifted outside the sanctuary to check the possibility of spread of diseases from these birds and animals to denizens of the sanctuary.

5. **Rampara Sanctuary:** The sanctuary is badly infested by Vilayeti Babool (*Prosopis juliflora*), which is alien invasive species and has badly affected habitat of the sanctuary. The Chief Wildlife Warden, Gujarat should be asked to take immediate steps to remove the invasive trees and replace them with native species e.g. *Ficus bengalensis, Ficus religiosa, Zizyphus numularia,* etc.The Chief Wildlife Warden should have requested to ensure that buffer areas of the sanctuary and wild animal corridors e.g. Bhanselo, Pakhario, Rojhaharo, Mesaria Vidi, especially Mandav Corridor, should properly protected to ensure safe and smooth movement of wild animals. Captive breeding of Asiatic lion (*Panthera leo persica)*, Chinkara *(Gazella benettii)* and Cheetal *(Axis axis)* is being carried out in the sanctuary for *ex-situ* Conservation of these species. These captive breeding centers should be as per norms of the Central Zoo Authority.

6. **Ratan Mahal Wildlife Sanctuary:** Geographical area of the sanctuary (56 sq km) is too small for effective conservation of large animals e.g. Leopard and Sloth Bear. The State Government may be requested to include forest areas in Malwa Hills, which is an important Sloth Bear habitat. This has also been recommended by GEER Foundation.

7. **Thol Wildlife Sanctuary:** There are many polluting industries, e.g. cement, chemicals and others, in the close vicinity of the sanctuary. These pose a serious threat to the sanctuary. Efforts should be made sensitize these industries to strictly follow emission and other norms of the Environment Protection Act, 1986. These industries should also be

asked to contribute financial and other resources for protection and conservation of rich biodiversity of the sanctuary under corporate social responsibility.

1. Barda Wildlife Sanctuary, Gujarat
MEE Score- 60% (Good)
Management Strengths:

1. The sanctuary was earmarked for second home for lions in 1979.
2. The sanctuary has two seasonal rivers namely Kileshwari and Jojhari.
3. There are two large dams (Khambhala and Fodara) and two small dams (Ransar and Gulasagar) inside the sanctuary.
4. There is no scarcity of water, even during drought period.
5. There is no encroachment of forest land inside the sanctuary.
6. The incidence of forest fires is minimal.
7. Adequate and timely funding is provided for the sanctuary from the State budget.
8. The residents of nesses live inside the sanctuary and act as eyes and ears of PA managers. They assist Gujarat Forest Department by reporting forest/ wildlife offences and also convey complaints of villagers. Concerned forest guard holds weekly meetings regularly.
9. The level of human wildlife conflict is moderate
10. Cattle vaccination is done regularly

Management Weaknesses:

1. The improvement of the habitat with respect to introduction and rehabilitation of lions, in terms of habitat for prey and regulation of the nesses, considering that the sanctuary was established in 1979.
2. The final notification of the Sanctuary has not yet been issued.
3. The condition of the habitat in the corridor area (Moti Vidi) is better than within the sanctuary.
4. There are 62 nesses, with a large cattle population, within the sanctuary
5. There are polluting industries e.g. Cement and Chemical industries, near the sanctuary

Immediate Actionable points:

1. Attractive incentives should be offered to Maldharis to reduce number of cattle held by them and to dissuade them from erecting seasonal nesses.
2. Legal formalities should be completed and the final notification issued under Section 26A of the Wildlife Protection Act, 1972.
3. Small windmills, for ensuring regular water supply to wild animals through waterholes, should be maintained properly.
4. Water holes and check dams must be maintained properly to ensure supply of water to wildlife, particularly during drought season.
5. Invasive plant species in the sanctuary (*Cassia tora* and *lantana camera*) need to be controlled.
6. Corridor between Alech forest (Ranavav Range) and Barda sanctuary must be secured for safe movement of lions and other wild animals.
7. The norms of CZA must be followed in establishing captive breeding centers for lions, Cheetal and Sambar and in releasing of captive-bred animals into the wild.
8. Regular disease surveillance among wild animals should be carried out.
9. Communication network (wireless) must be maintained.
10. Soil and moisture conservation works must be accorded high priority in the sanctuary.
11. An adequate number of motorcycles must be provided to frontline staff for patrolling
12. Equipments (GPS, binoculars, compass) must be provided to field staff.

13. Timelines needed for improvement of habitat for lions
14. The power supply needs to be augmented with solar panels.
15. All staff vacancies must be filled up.
16. The movement of religious visitors inside the sanctuary, which may create problem in future, should be regulated.

Evaluators
Shri Rajiv Kumar Srivastava, Former PCCF, Govt. of Manipur
Dr. Ashish David, Faculty, IIFM, Bhopal
Dr. Nita Shah, BNHS, Mumbai
Dr. Gautam Talukdar, Scientist-E, WII

2. Narayan Sarovar Chinkara Wildlife Sanctuary, Gujarat
MEE Score- 65.50% (Good)

Management Strengths:

1. Narayan Sarovar Wildlife Sanctuary has some unique and endangered species of wildlife e.g. Great Indian Bustard, Houbara Bustard, Pied Tit, Caracal, Chinkara, Leopard, Desert Cat, Indian Wolf, Black Cobra, and Spiny Tailed Lizard.
2. Narayan Sarovar Wildlife Sanctuary has a unique distinction of having inland mangrove forests, near Gugaliyana Rakhal Village, away from sea coast.
3. The Sanctuary is in close proximity to religious pilgrim places of Narayan Sarovar and Koteshwar Mahadev Temple. Famous temple of Annapurna Mata is also very close to the sanctuary; hence number of visitors to the sanctuary is high.
4. Management Plan of Narayan Sarovar WLS for the period 2006-07 has expired. Revised MP of the Sanctuary has already been submitted and it is pending with the State Government for approval.
5. Zonation approach has been adopted for conservation and management of wildlife in the sanctuary.
6. Eco Sensitive Zone (ESZ) of Narayan Sarovar WLS has been notified by the Central Government on 31st May, 2012.
7. GUIDE, GEER Foundation and Corbett Foundation are scientific research organizations, conducting research projects and strengthening the database of the sanctuary.
8. Grasslands inside and near the sanctuary produce large quantities of grass, which is essential for survival of wildlife and domestic cattle also.

Management Weaknesses:

1. There are 35 villages inside Narayan Sarovar WLS, with a human population 20,883 (2001 census) and a cattle population 242,34 (1992 census) leading to very heavy biotic pressure. Further, a large cattle population from other parts of state and from Rajasthan congregates in the sanctuary, particularly during drought, compounding the problem.
2. Narayan Sarovar WLS has been notified under Section 18 of the Wildlife Protection Act, 1972. However, rights of claimants have not been settled yet, hence final notification to declare the sanctuary under Section 26A, could not be issued. This has led to uncontrolled grazing of domestic cattle all over the sanctuary, thereby seriously affecting natural regeneration of grasses and affecting food supply of herbivores.
3. Presence of large number of domestic cattle not only causes serious competition for food for wild animals, but also results in hunting of cattle by predators and thus increasing human wildlife conflicts. Domestic cattle also act as a source of of diseases among wild animals.

4. As in many otherforest areas of Gujarat and Rajathan, *Vilayati* Babool (*Prosopis juliflora)* has spread uncontrollably like a weed in Narayan Sarovar Wildlife Sanctuary. It has seriously affected other native vegetation. Wild animals also tend to avoid dense areas of *Prosopis juliflora.* Thus the effective habitat area is reduced.
5. Narayan Sarovar WLS has a long history of illegal capture of Spiny Tailed Lizard (*Saara hardwickii*) or Sanda. Oil is extracted from tail of the lizard, which is used as an aphrodisiac. It is also used in Ayurvedic and Unani systems of medicine. The meat of lizard is also eaten. The Lizard is a significant prey base for raptors and mammalian predators of desert landscape. Indiscriminate killing of lizards can seriously impact complex web of life.
6. Census of important species wildlife is not conducted regularly. Census Chinkara, Caracal, Wolf, Hyena, GIB and Houbara Bustard needs to be taken up urgently.
7. An annual census of birds, including water fowls, is critical, as the sanctuary is along Central Asian Flyway, considering that India is a signatory and active member of Convention on Conservation of Migratory Species (CMS).
8. Eleven of 37 protection staff posts of the sanctuary are vacant, including 9 critical posts of Beat Guard. There is an urgent need to fill up these posts. All field staff should be equipped with binoculars, GPS, torches, camera and other equipment.
9. None of the field staff have been trained in wildlife management.
10. Narayan Sarovar Sanctuary is located in an area that is rich in mineral deposits. It is also surrounded by mineral based industries. In fact, the State Government has denotified 321 Km^2 area of sanctuary to exploit rich mineral deposits of the area.

Immediate Actionable points:

1. Although the sanctuary has been notified under the Section 18 (Intention to declare the area as a wildlife sanctuary) in 1981 itself, the rights of the villagers have not been settled yet. The rights of villagers should be completed and settled expeditiously and the final notification of the sanctuary, under Section 26 of the WLP Act, 1972 should be issued expeditiously.
2. The Sanctuary is under extreme biotic pressure. To conserve the unique flora and fauna of the sanctuary, the villages that are inside the sanctuary should be relocated outside voluntarily on priority. Domestic dogs should be kept out of the sanctuary.
3. Unrestricted grazing of domestic cattle poses a serious threat to the sanctuary. An appropriate system of rotational grazing of cattle should be designed, in consultation with villagers, to minimize damage to critical habitat and flora and fauna of the sanctuary. This will also reduce human wildlife conflict in the area.
4. Last Management Plan of the sanctuary has lapsed already, and current management plan is still pending with the State Government. The new management plan should be approved at once and implemented immediately.
5. Illegal hunting of Spiny Tailed Lizard or Sanda (*Saara hardwickii*) is going on for many years. Immediate steps should be taken to check this illegal activity.
6. Estimation of population of Chinkara and other important animal species in the sanctuary should conducted, according to a well designed calendar, to keep track of trends in fluctuations in these populations. Local villagers and NGOs should be actively involved in census activities.
7. The sanctuary is located along the Central Asian Flyway. An annual bird count is recommended to keep track of migratory and resident bird species.
8. The infestation of Vilayati Babool (*Prosopis juliflora*), an exotic, has assumed alarming proportion in the sanctuary. It is recommended that Prosopis be removed in phased manner the sanctuary, according to a scientifically prepared habitat improvement plan.
9. Mineral based industries in the vicinity of the sanctuary should be mapped. These should also be motivated to contribute towards improvement of the Sanctuary, as part of

Corporate Social Responsibility (CSR) to improve the adversarial relations between these industries and the sanctuary and to augment resources for management of the PA.

10. New linear infrastructure project e.g. roads, railway lines, canals and transmission lines should be in conformity with the WII Guidelines on the subject.Even existing linear infrastructure should be retrofitted to minimize fragmentation of wildlife habitat and reduce human wildlife conflicts.
11. Agriculture Department of Gujarat should be requested to facilitate the coverage of farmers, close to the sanctuary, under Pradhan Mantri Fasal Beema Yajana, to reduce human wildlife conflicts.
12. Mapping of vegetation of the sanctuary should be taken up periodically to assess changes in habitat, to readjust for management of the PA.
13. Corridors for migratory animals and critical habitat of the fauna should be identified on the ground and managed accordingly.
14. Number of EDCs should be increased.
15. Frontline field staff and officers of the sanctuary should be provided vehicles, equipment and other modern amenities for effective management of the PA. They should also be given formal training in wildlife management. The Staff strength of the PA should also be enhanced.
16. Religious tourists visiting Narayan Sarovar, Koteshwar, Oran Mata temples and Annapurna Devi temple should be attracted to visit the sanctuary, through development of tourist facilities and infrastructure outside the PA.

Evaluators
Shri Rajiv Kumar Srivastava, Former PCCF, Govt. of Manipur
Dr. Ashish David, Faculty, IIFM, Bhopal
Dr. Nita Shah, BNHS, Mumbai
Dr. Gautam Talukdar, Scientist-E, WII

3. Paniya Wildlife Sanctuary, Gujarat
MEE Score- 74.14% (Good)

Management Strengths

1. Asiatic lion is unique to India and is considered as "Pride of Gujarat", hence the State Government gives high priority to conservation of lions and management of Gir Protected Area landscape, including Pania Wildlife Sanctuary. This sanctuary is part of core area of 'Gir PA'
2. Pania sanctuary is a very important lion habitat. This along with Gir National Park & Sanctuary and Mitiyala WLS constitute Core Zone of Gir PA landscape.
3. Tourism activities are not permitted inside Pania sanctuary
4. Two Rivers, namely Shetrunji and Singhoda, originate inside Paniya WLS. These constitute lifeline of Gir PA landscape.
5. Asiatic lion habitat is spread over many PAs and Reserved Forests and Protected Forests, Entire Gir PA is managed under a single Management Plan, hence landscape approach is natural for management of PAs.
6. Adequate and timely funding support is provided to the sanctuary by the State Government.
7. Complaint mechanism in place with *ness* (a temporary settlement for migratory cattle herders and their animals) and Gujarat forest dept. The forest guard holds regular weekly meeting with villagers.
8. Pania is rich in wildlife. MEE Team sighted leopard and Sambhar in Kabri Timbi area and Chinkara near Chanchai Village.

Management Weaknesses

1. As the Gir PA is managed according to a single Management Plan and landscape basis, local issues relating to Pania wildlife sanctuary sometimes do not get adequate attention.
2. Incidence of *Babesia* disease causing death of lions, as late as December, 2018, demands periodic surveillance of outbreak of diseases in Gir PA system for effective conservation of unique wildlife.
3. Eco Sensitive Zone of Pania sanctuary was not cleared by the Central Government, till the time of REC visit.
4. A new trend is noticed that Maldhari leave their Ness in Jamvala in the beginning of summer and return back in June, this indicates inadequate availability of fodder within the Sanctuary.
5. There are 2 *nesses* within the Sanctuary

Immediate Actionable Points

1. Wind mills at "Leela Pani" ness, should be maintained in good condition for charging wireless sets and other needs.
2. Supply of water for wildlife during dry season is of utmost importance. There is requirement of additional takers and Talavadis by the Forest Department.
3. Staff strength of Pania Sanctuary needs to be strengthened.
4. As lions are moving out off PA and colonizing new territories, there is an urgent need to study their dispersal patterns and corridors.
5. Central Zoo Authority norms should be followed for captive breeding center for lions, and other animals for release into the wild.
6. Peoples' participation should be encouraged by strengthening EDCs and Micro Plan preparation.
7. Communication network (wireless) to be maintained
8. Adequate number of motorcycles to be provided to frontline field staff.
9. Equipments (GPS, binoculars, compass) must be provided
10. Augmentation of power with solar panels

Evaluators
Shri Rajiv Kumar Srivastava, Former PCCF, Govt. of Manipur
Dr. Ashish David, Faculty, IIFM, Bhopal
Dr. Nita Shah, BNHS, Mumbai
Dr. Gautam Talukdar, Scientist-E, WII

4. Porbandar Wildlife Sactuary, Gujarat
MEE Score- 67.59% (Good)

Management Strengths:

1. The sanctuary is located in the heart of Porbandar city.
2. There is practically no human pressure (biotic interference) on the sanctuary.
3. The funding from the state budget is adequate and timely.
4. The sanctuary, due to its prime location, functions as green lung of Porbandar city
5. The State Government organizes Karuna Abhiyaan, during Makar Sankranti, during which people rescue injured birds and bring them to veterinary hospitals for treatment and rehabilitation.
6. The management plan of the sanctuary is being implemented. It has been updated and approved.

7. Nature education programs are regularly conducted in the sanctuary.
8. NGOs help the Forest Department in organizing awareness camps and organizing training camps.
9. Flamingo festival celebrated annually, provides unique opportunity to ornithologists, bird watchers, forest officials and stakeholders and helps promote conservation in this PA.

Management Weaknesses:

1. The area of the sanctuary is very small and the bird diversity is poor, as compared to its satellite wetlands.
2. There is a rescue center for injured birds/ animals within the sanctuary premises, these birds, brought from distant areas, may act as a source of infection for wildlife of the sanctuary.
3. The sanctuary is in a low lying area; hence water from Porbandar city flows into the sanctuary. Sometimes sewage from the city also flows in and contaminates the sanctuary.
4. Visitor records are not maintained in the sanctuary.
5. The complaint registers are not being maintained.
6. There are polluting industries (cement, chemical industries) close to the sanctuary.
7. The sanctuary is vulnerable to the effects of climate change.

Immediate Actionable Points:

1. Satellite wetlands, e.g. Gosabara-Mokrasagar, Chhaya Runn, Kuchhadi, Javar, Subhashnagar, Bardasagar and Mendha Creek must be notified as part of the sanctuary. The possibility of declaring these wetlands as community reserve need to be explored.
2. Different birds and animals in the sanctuary need different water level, habitat in the sanctuary must be carefully managed to meet their ecological requirements.
3. An outlet needs to be provided to drain the wetland of excess water. Inflow of sewage waste inside the sanctuary must be stopped immediately.
4. Invasive species e.g. *Papalum disticum* (Knott Grass), *Eichorrnia crassipes (*Water Hyacinth) &*Prosopis juliflora* need to be removed. Native tree and shrub species should be planted.
5. The bird and animal rescue center should be shifted outside the sanctuary to prevent spread of infection among wild animals and birds of the sanctuary.
6. The boundaries of satellite wetlands need to be secured.
7. A token amount must be charged and a ticket issued for entry into the sanctuary. A visitor entry log must be maintained.
8. The equipment (binoculars, spotting scope) need to be provided to the field staff.
9. All the vacant staff positions need to be filled
10. Specific training must be given to the field staff with respect to bird identification, habitat management, etc.
11. A complaint and suggestion register must be maintained in the sanctuary.
12. Research work must be encouraged through local institutions.
13. Social media platforms and nature clubs need to be promoted for conservation of birds.

Evaluators
Shri Rajiv Kumar Srivastava, Former PCCF, Govt. of Manipur
Dr. Ashish David, Faculty, IIFM, Bhopal

Dr. Nita Shah, BNHS, Mumbai
Dr. Gautam Talukdar, Scientist-E, WII

5. Rampara Vidi Wildlife Sanctuary, Gujarat
MEE Score- 71.43% (Good)

Management Strengths:

1. Rampara Wildlife Sanctuary was Shooting Reserve of the erstwhile Ruler Wankaner Princely Estate, till it was acquired in 1973 by the Government of Gujarat in 1973 and notified as WLS in 1988, thus it has past history of being managed as wildlife reserve leading to well preserved wildlife and its habitat.
2. The area is compact. There are no recorded rights or privileges, except for right of way on three existing cart roads.
3. It has very rich and characteristic wildlife. It was northernmost limit of leopard in Saurashtra till 1950s. Sambhar, which was reported locally extinct in 1950s has reappeared again. Lesser Floricans (*syphiotides indicus)* use to come and breed here. Nowadays these birds are not seen here since more than a decade, probably due to loss of grass cover due to overgrazing by the cattle.
4. Endangered, threatened and endemic species plants e.g. Guggal (*Commiphora wightii*), Indian Ceropegia (*Ceropegia vincaefolia),* Lodari (*Flacortia inidicus*) and Indian bdellium tree (*Viola cinerea)* are also found here.
5. The Sanctuary is well demarcated on the ground by cairns, pillars and loose boulder walls.
6. Rampara Sanctuary is ideally suitable for *Ex-situ* Conservation of Asiatic Lions in Central Saurashtra, because of its isolation from human imprints, lack of roads, no pressure of tourism and habitat wise it resembles the lion habitat.
7. Rampara Wildlife Sanctuary has been identified as the site for preservation of gene-pool of Asiatic Lion for ex-situ conservation, along with Sakkar bagh Zoo, Umath and Barda. Captive breeding of Asiatic lions is being done here successfully since 2010.
8. Captive breeding of Chital (*Axis axis)* and Chinkara (*Gazella benettii*) is being carried successfully since 2008 and 2011 respectively.
9. Adequate and timely funding support is provided to the sanctuary by the State Government.
10. Eco Sensitive Zone Notification has been issued on 28.12.2017.

Management Weaknesses:

1. Like many otherforest areas of Gujarat and Rajathan, *Vilayati* Babool (*Prosopis juliflora)* has spread uncontrollably like a weed in Rampara sanctuary. It has caused local extinction of local trees e.g. Banyan (*Ficus bengalensis*) and Peepal (Ficus religiosa) trees from valley bottoms of sanctuary. These trees are highly preferred by many species of birds and wild animals.
2. Lesser Florican (*Sypheotides indicus*) used to visit upper ridges of Rampara sanctuary, where tree growth was sparse and predominant growth was grass, immediately after monsoon. Some even used to breed and nest here. However, these birds are not seen for more than 10 years, possibly due to destruction of grasslands due to overgrazing by cattle.
3. Total area of Rampara Sanctuary is 15 Sq Km (1501.21 ha) only, which is not viable for long term conservation rare and endemic flora and fauna of the Sanctuary. Declaring it as one of the 4 centers for gene-pool of Asiatic lion, for *ex-situ* conservation of lions has put additional burden on the sanctuary, in terms of its area.
4. Rampara sanctuary falls under Rajkot Forest Division under Junagadh Circle. Management of the Sanctuary is done by Range Forest Officer (RFO) Wankaner, with support of one

Forester and two Forest Guards. RFO has also been entrusted with management of another four Vidis (grasslands). The Sanctuary does not have any mobile squad.

Immediate Actionable points:

1. Corridors and buffer areas of the Sanctuary, namely Bhanselo, Pakhario, Rojhaharo, Mesaria Vidi especially Mandav Corridor, should also be properly protected and managed.
2. According to a study of the sanctuary carried out by the Corbett Foundation in 2015-16. There are more than 64,000 trees of *Prosopis juliflora* in the Sanctuary. This is an exotic species and not ecologically desirable. It should be completely eradicated from the sanctuary. A very senior officer had suggested that covering the stump of Prosopis tree with coal tar, a road building material, can be very effective in eradicating the tree.
3. At many places thickets of jungle have become so dense that animals tend to avoid such areas. Thinning and canopy opening of trees should be taken up regularly to make these areas more accessible to wildlife and also to promote regeneration of grasses.
4. Food supply for Chinkara, Blue Bull and many bird species can be enhanced by planting Amla, Imli, Banyan, Gular, Peepal, Karamda and other trees.
5. Threatened and endemic plant species e.g. Gugal, Ceropegia sp, should be regenerated in patches to bring back population of these species to a safer limit.
6. Grasslands are an important component of the sanctuary. Tender and palatable grasses should be planted in patches to improve quality of grass. Grass should not be harvested in these patches so as to maintain food and shelter to wildlife.
7. A water tank should be erected on a hill top and important water points should be connected with pipes to supply water for wildlife during lean season.
8. Grazing pressure causes serious competition between wildlife and cattle. People should be educated and actively involved in the conservation programs. Local people should be supplied grass and fodder. Boundary wall of the sanctuary should be repaired and vulnerable points should be protected by concrete or brick walls. Many reptiles used to take shelter in old rubble style walls, which is not possible in concrete walls, hence some parts of walls should use traditional walls made of rocks and stones.
9. Staff strength of Rampara WLS needs to be strengthened. Another post of RFO should be sanctioned exclusively for management of the Sanctuary.
10. Free and uncontrolled grazing of cattle by 9 villages, surrounding the sanctuary, is a major threat to the sanctuary and its inhabitants. There are wastelands covering an area more than 6520 ha surrounding the PA. These are not cultivated and used by villagers solely for grazing of their cattle. This area should be developed as productive grasslands to meet requirement of local villagers and wildlife. Eco-development scheme can be used for development and management of theses grasslands.
11. Waste disposal of lion enclosures should be maintained scientifically, as per guidelines issued the Ministry for biomedical wastes.
12. Census of important wildlife species e.g. Hyena, Wolf, Chinkara, Chital and Sambhar should be carried out regularly at fixed interval.

Evaluators

Shri Rajiv Kumar Srivastava, Former PCCF, Govt. of Manipur
Dr. Ashish David, Faculty, IIFM, Bhopal
Dr. Nita Shah, BNHS, Mumbai
Dr. Gautam Talukdar, Scientist-E, WII

6. Ratanmahal Sloth Bear Wildlife Sanctuary, Gujarat
MEE Score- 72.50% (Good)

Management Strengths

1. The Sanctuary is at confluence of Vindhya Mountain Range and Malwa Plateau. It is also close to Satpura Mountain Range, which is considered as an important pathway for dispersal of species between the Himalayas and the Sahyadri.
2. There have been very few incidents of encroachment of land, poaching and forest fires in the sanctuary.
3. There are adequate sources of water supply inside the sanctuary.
4. The eco-sensitive zone of the sanctuary has been notified.
5. NGOs are actively involved with Ratan Mahal Wildlife SAnctuary.
6. Local communities are strongly involved with the management of the PA through eco-development committees (EDCs) and self-help groups (SHGs).
7. There is a good potential for conducting research and studies in the sanctuary.

Management Weaknesses

1. The extent of the sanctuary is too small for long term conservation of large animals such as Sloth Bear and Leopards.
2. The villagers of neighbouring villages and their cattle are dependent on the PA for supply of grasses round the year. The uncontrolled grazing within the sanctuary is a threat to natural regeneration of trees and biodiversity of the PA. It is also leading to compaction of forest soil.
3. The prey base of herbivorous animals is inadequate. As a result, there is hunting of domestic cattle by Leopards and other carnivores.
4. Villagers set fire to forest areas for collection of NWFPs such as Mahua flowers, seeds, honey, etc. There is therefore risk of forest fires in the sanctuary.
5. The management of the sanctuary has been entrusted to the territorial DFO, and thus the focus on conservation of wildlife has been diluted.

Immediate Actionable Points

1. The ESZ needs to be monitored and assessed intensively.
2. Rotational grazing of cattle and livelihood support for villagers, dependent on the sanctuary must be explored.
3. A mid-term review of the management plan should be carried out. Scientific research inputs will be helpful for the review.
4. The preparation of Zonal Master Plan preparation can be more participatory.
5. Landscape level planning needs to be considered for the forested and non-forest areas nearby.
6. Post of ACF is recommended for the PA.
7. Creation of additional staff quarters within/ close to the sanctuary is essential.
8. Mark and maintain permanent transects for regular population estimation of large mammals.
9. Interactive panels could be introduced in the interpretation centre and the information on the existing panels must be updated.
10. A Dedicated website must be developed for Ratanmahal sanctuary. Films relating to wildlife can be screened at the nature camp sites in the evenings for visitors.
11. Eco-guide training can be provided to the local youth. Binoculars and books must also be provided to them for identifying plants and animals.
12. An award or appreciation scheme needs to be instituted for meritorious staff members.
13. Uniforms should be provided to all staff members including casual employees. The availability of GPS and infrared camera traps must be ensured.

Evaluators
Shri Rajiv Kumar Srivastava, Former PCCF, Govt. of Manipur
Dr. Ashish David, Faculty, IIFM, Bhopal
Dr. Nita Shah, BNHS, Mumbai
Dr. Gautam Talukdar, Scientist-E, WII

7. Thol Lake Wildlife Sanctuary, Gujarat
MEE Score- 74.16% (Good)
Management Strengths:

1. It is one of the eight national wetland sites in Gujarat, which have been identified for conservation.
2. The Sanctuary is situated close to Ahmedabad city; hence it is popular among tourists.
3. There are no villages or human habitations inside the Sanctuary.
4. There are almost no incidents of poaching or cases of other forest offences in the sanctuary.
5. Nature and environment education camps are conducted regularly in the sanctuary.
6. The sanctuary holds good potential for wildlife research.

Management Weaknesses:

1. There are cement, chemical and other industries in the vicinity of the sanctuary that pose significant threat to its rich wildlife.
2. There are 21 oil wells inside the sanctuary, out of these 13 wells are operational.
3. The staff strength for the sanctuary is Inadequate.
4. The number of vehicles, including boats and the equipment are inadequate.
5. There is no interdepartmental coordination.
6. Landscape level planning and management is required.
7. Invasive species such as Water Hyacinth and Knot Grass are present. *Prosopis juliflora* spreads vigorously during drought, affecting the habitat and extent of the wetland.

Immeditate Actionable points:

1. The carrying capacity of the Sanctuary (tourism) must be estimated and timing regulated so that visits of tourists are distributed across different time slots. A landscape approach must be adopted for conservation of the rich avifauna.
2. The core area of the sanctuary must be identified. Tourism activities should not be permitted in this area.
3. An adequate number of posts must be created among the frontline field staff. The newly appointed staff members must be posted immediately.
4. The equipment and infrastructure of the sanctuary must be augmented. The livery of staff must be approved.
5. Thol Conservation Society must be formed at the earliest so that the funds that are already available can be used. The finances must also be augmented.
6. Regular floral and faunal studies should be conducted with help from Universities, colleges and volunteers from the region.
7. The National Wetland Atlas, Gujarat, prepared by Space Applications Centre, Ahmedabad must be consulted to gain better understanding of the distribution of the habitat and the bird population at the landscape level. The Zonal Action Plan for ESZ must include inputs from the wetland atlas.
8. The staff must be trained periodically on census protocols and bird population monitoring.

9. Efforts must be made to associate and sensitise local industries for promoting conservation of wildlife and taking up welfare or eco-development activities for the villages around the sanctuary.

Evaluators
Shri Rajiv Kumar Srivastava, Former PCCF, Govt. of Manipur
Dr. Ashish David, Faculty, IIFM, Bhopal
Dr. Nita Shah, BNHS, Mumbai
Dr. Gautam Talukdar, Scientist-E, WII

LAKSHADWEEP

One of the MEE team of Western Region conducted MEE of Pitti Bird Sanctuary, Lakshadweep. Detailed report given separately, some specific observations are discussed below:

1. Pitti Bird Sanctuary has been notified in 1995. However, it still does not have any dedicated staff, budget and equipments. This issue must be taken up with Lakshdweep Administration by the Ministry. Lakshdweep administration should be asked to assess requirements of the sanctuary and provide necessary staff and financial and infrastructure support urgently.

2. The sanctuary does not have any management plan, although Bombay Natural History Society (BNHS) has been recently entrusted with responsibility of the preparation of management plan of the sanctuary. The Ministry and the UT Administration should ask BNHS to prepare the management plan, for the sanctuary including 40 sq km seascape added to the sanctuary in 2019, in a time bound manner.

3. Lakshdweep Forest Department has sought permission of the Ministry for procurement of 138 vehicles. Requisite funds for purchase of these vehicles are already available with FD and only permission is required. The Ministry may examine this proposal and take appropriate action urgently.

8. Pitti (Bird Island) Wildlife Sanctuary, Lakshadweep
MEE Score- 43.48% (Fair)

Management Strengths

1. Pitti Island is one of the very few large breeding colony of pelagic birds in India. It has been used by (1) Great Crested Tern (*Sterna bergii),* Bridled Tern (*Sterna anaethetus*) for roosting and by Sooty Tern (*Sterna fuscata*) and Brown Noddy (*Anous stolid*) for nesting since time immemorial. It has been declared an Important Bird Area (IBA) by BNHS, RSPB and Birdlife. It is located along the Central Asian Flyway.
2. IUCN and Mission Blue have declared that the Lakshdweep Islands and Andaman & Nicobar Islands, in India, as “Hope Spots”.
3. Pitti Island is difficult to approach, even in good weather. Hence there is very little biotic interference in the PA.
4. There are no mammal or reptilian predators within the sanctuary.
5. Accumulation of guano, which is periodically washed out into the sea, has increased the nutrition load in the sea around Pitti Island. This has made the island an important and fertile habitat for marine creatures.

Management Weaknesses

1. Pitti Wildlife Sanctuary was notified in 1995. However, the PA has no dedicated staff, budget or infrastructure for its management. There is practically no management of the sanctuary, except for collection of plastic items and ghost nets from time to time.
2. The sanctuary does not have any management plan. neither current nor expired. However, BNHS has recently been entrusted with the responsibility of preparing a management plan for the sanctuary.
3. Pitti Island is very small, with a geographical extent of 0.01 km^2 of land. However, a 40 km^2 seascape has been added to the sanctuary by Lakshdweep Administration on 25.01.2019. Population of sea birds has declined steeply from 12000 in 1978 to 4750 in 2014.
4. Occasionally local fishermen steal bird eggs for food and also sale on account of its perceived medicinal values.

Immediate Actionable Points

1. BNHS should be asked to provide full details of marine flora and fauna of extended seascape and highlight critical issues involved in the sanctuary.
2. It is suggested that some posts (one RFO, one or two scientists, two or three Foresters, five or six Forest Guards) be created, along with some support staff posts, for the management of the sanctuary.
3. Realistic budgetary and infrastructure support should be provided for scientific management of the sanctuary. The important equipment suggested for this purpose are uniforms and livery, vehicles, boats, scuba diving gear, binoculars, marine and normal cameras, etc.
4. The management plan of the sanctuary, including the seascape, should be prepared under the guidance of the Wildlife Institute of India, using remote sensing, GIS and other scientific tools. The PA landscape can be well demarcated using bathymetric maps.
5. The three islands, namely Bitra, Beliyapani and Charayupani, are very important biodiversity hotspots, especially as nesting sites for shore birds along the Central Asian Flyway, in the Arabian Sea.
6. The officers and staff should be provided adequate training.
7. There should be regular patrolling by boats around Pitti island, especially during the nesting seasons of the shore birds and the peak tuna fishing season, mainly to control poaching of eggs of sea birds and to monitor other biodiversity events.
8. A communication network (wireless) should be established between patrolling boats and other vehicles and the PA Manager and CWLW.
9. Eco-development committees (EDCs) should be formed of fishermen and other people associated with egg poaching. They should be provided free chicken eggs and training and financial support for alternative livelihoods discourages collection of eggs of pelagic birds.
10. Eco-tourism should be promoted in the area so that the local people develop a stake in the sanctuary and can earn an additional income. This is likely to put an end to the ecologically disastrous practice of egg poaching of seabirds.
11. Wildlife cases need to be registered and an offence register maintained.
12. A protocol must be put in place for diseases (especially for avian influenza) and for monitoring cetaceans, turtles and fish.
13. The naval base has proposed the erection of a lighthouse on the island Parumal Par, near Bitra. A detailed biodiversity inventory of the island and an EIA are needed before the project is cleared under the Environment Protection Act, 1986.
14. Bird rescue and translocation operations could be carried out according to guidelines of the CZA.

15. The plans to establish beach and lagoon villas (Samudram Package) might negatively impact the Pitti landscape in the long run as the nearest inhabited island is Kavaratti (24 km from Pitti). The corals need to be declared as conservation reserves.
16. Infra structure: 138 vehicles were requested to MoEF, funds are present, only permit is required.
17. There are plans to have an international atoll research centre (budget of Rs.250 crores) and a marine turtle research centre.
18. Biodiversity inventories may be conducted as the area is rich in fish resources. Mapping of ship movements maybe be helpful in the overall management of the marine biodiversity.

Evaluators
Shri Rajiv Kumar Srivastava, Former PCCF, Govt. of Manipur
Dr. Ashish David, Faculty, IIFM, Bhopal
Dr. Nita Shah, BNHS, Mumbai
Dr. Gautam Talukdar, Scientist-E, WII

MADHYA PA RADESH

The Regional Committee for MEE in Protected Areas (PAs) of Madhya Pradesh (MP) in Western Region visited 9 PAs- (i) Kuno-Palpur Wildlife Sanctuary (WLS), (ii) Madhav National Park (NP), (iii) Pachmarhi WLS, (iv) Ralamandal WLS, (v) Sailana WLS, (vi) Sardarpur WLS, (vii) Singhori WLS (viii) Son-Garhiyal WLS and (ix) Veerangana Durgavati WLS). Based on the Management effectiveness evaluation of these Protected Areas in the State of Madhya Pradesh, main suggestions/ recommendations proposed by the MEE team for the better and effective management of protected areas in the state, are as follows:

1. Overall management of PAs evaluated in 2018-19 in MP is found good (average rating being 6.7). Of the nine PAs evaluated, three PAs (namely Kuno-Palpur WLS, Madhav NP and Pachmari WLS) fall in 'very good' category, four PAs (Ralamandal WLS, Sailana WLS, Son-Garhiyal WLS and Veerangana Durgavati WLS) fall in 'good' category and two PAs (Sardarpur WLS and Singhori WLS) fall in 'fair' category.

2. It is noticed that practice of preparation of management plan of PAs varies in different PAs. In case of some PAs (like Kuno-Palpur WLS), management plan is a part of the Working Plan of territorial forest division, while there are separate Management Plans for some other PAs. In case of Pachmarhi WLS, there is no separate management plan. It is managed under Tiger Conservation Plan (TCP) of Satpura Tiger Reserves. It is proposed to have separate management plan for each PA.

3. Plan of introduction of lions in Kuno-Palpur WLS needs to be reconsidered as MEE team finds the area to be naturally more suitable for tiger conservation. Converting dense vegetation into grasslands artificially to make it suitable for lions, may result in long term ecological consequences on other species. However, this recommendation needs further expert opinion.

4. Reintroduction of tiger or establishing a 'tiger safari' in Madhav NP as proposed by the field Director of NP, needs a serious consideration. Opinion of experts in this area may be taken.

5. There is a need to improve in the areas like research, tourism. Involvement of NGOs, people's participation and publicity. The State Forest Department may approach reputed research organizations/Institutes/Universities/NGOS and can also sponsor research fellowship to promote research in PAs. Promotion of ecotourism has a vast potential in all these PAs except Sailana and Sardarpur WLS which are a single species (Lesser Floricans) conservation- oriented PAs and have limited tourism potential. Each PA should have a separate website.

6. In Pachmarhi WLS, there is a need to control monkey menace as monkey bite cases keep on increasing. In addition, the ecology of this PA gets affected adversely due to visit of lakhs of pilgrims to the shrines in the area. Though it is suggested to consult the local religious heads and explore the possibilities of shifting the shrines to some other locality, the suggestion is extremely difficult to implement as these shrines have historical importance and religious sentiments of pilgrims are deeply associated with these shrines.

7. Sailana WLS and Sardarpur WLS have a single species-oriented management i.e., lesser floricans. Habitat in these PAs is getting affected by presence of Nilgai, grazing of cattle, use of pesticides in agricultural crops and hostile behaviour of local people. Habitat areas needs to be fenced completely to avoid grazing by nilgais and local cattle. Grazing by cattle of local population may be allowed after the lesser floricans leave the area. NGOs may be involved to educate people to discourage use of faulty agricultural practices and reducing their hostility towards forest officials.

8. In most of the PAs, mobility of protection staff is a constraint. The Department should address to this problem. Though in some PAs, manpower is trained in Wildlife management, regular short-term refresher training courses in different aspects of wildlife management should be conducted.

9. In Son-Garhiyal WLS, proper water inflow into the river should be ensured through regular communication between the sanctuary authorities and the authorities of Bansagar dam, and there should be an agreement to release a minimum quantity of water on a continuous and regular basis. There is a need to increase manpower to curb illegal sand mining in this PA.

10. Management plan of Veerangana Durgavati WLS has expired in 2016-17. New management plan needs to be prepared without any delay. The plan should include actions related to research activities, promotion of eco-tourism, people's participation in management through EDCs, extension activities, etc. in addition to the ongoing conservation activities. There should be an independent Field Director for this PA. Vulture habitat are well protected but research activities need to be augmented.

9. Kuno Palpur Wildlife Sanctuary, Madhya Pradesh
MEE Score- 79.16% (Very Good)

Management-Strengths

1. The biodiversity of the area is rich, and is being managed quite well.
2. There is no village inside the PA. Earlier, there were 24 villages inside the sanctuary. All these villages have been relocated successfully.
3. The efforts made by the PA management towards protection are commendable. Retired army personnel are deployed for protection. There is even a dog squad with two trained dogs to help with the protection efforts.
4. Most of the frontline staff are trained in wildlife techniques.
5. There are no human–wildlife conflicts in this PA.
6. The manpower and other resources, including funds and infrastructure, are sufficient.
7. A lot of attention is being given to grassland development. Nurseries of palatable grasses are being raised and maintained.

Management Weaknesses

1. There is a proposal to transfer some lions from Gir forest, in Gujarat and introduce them to this sanctuary, and therefore efforts are being made to make this area suitable as a habitat for lions. However, due to some legal complications, the proposal has got stuck in the apex court. This delay is affecting management interventions in this PA.
2. The tourism potential has not been exploited to the extent possible. The area has considerable tourism potential, but presently tourism is limited to picnic-like short duration visits. Considering its natural beauty, forests and wildlife, some tracks and nature trails may be developed for wildlife and nature lovers.
3. There is no publicity material available for distribution to the public though there is a souvenir shop near the guesthouse. This PA has no independent website.

Immediate Action Points

1. The focus of the sanctuary should be changed from lion to tiger conservation. The sanctuary is part of a continuous tiger conservation landscape. Tigers from Ranthambhore occasionally migrate to Kuno Wildlife Sanctuary and onwards to Madhav National Park, Panna Tiger Reserve and Datia. The introduction of lions in Kuno would bring in a totally new element into the landscape and would potentially disrupt the existing processes related to tiger dispersal and conservation. The habitat has vegetation which is denser than required by the lion. It is being manipulated as a grassland artificially.
2. It is suggested that the Madhya Pradesh Forest Department reconsider its decision of introducing lions in this area. The MEE team feels that the area is more suitable for tiger habitat. A meeting of experts be called and the decision be reviewed after taking into consideration all ecological parameters
3. At present a lot of attention is being devoted towards maintaining the openings and developing the grassland. This is a laborious and costly operation. If the sanctuary is made tiger-centric, efforts to develop grasslands may not be necessary to this extent. Natural succession may be allowed to take its course.
4. It is seen that the management plan of this PA is part of the working plan of the territorial forest division, and as such there is no separate management plan for this PA. It was also noticed by the MEE team that some other PAs have separate management plans. It is not understood why there are different practices among different PAs. The forest department should consider having a separate management plan specific to this PA.
5. The PA management is carrying out grassland management, weed removal, controlled burning and other similar habitat development activities. Though these activities are very positive and useful, the results are not being monitored scientifically. It is suggested that a research project be developed in collaboration with faculty members of the botany

departments of local colleges to monitor the results of these activities. The various permutations and combinations of grassland development, weed removal, brushwood removal and controlled burning should be studied and the results analysed. The findings should be disseminated in the form of scientific publications and internal notes of the forest department.

6. The results of line transect monitoring efforts should be analysed to generate density data relating to herbivores.
7. Records should be maintained of gun licenses in the buffer area.
8. Considering the potential of this PA, additional efforts should be made towards conservation of the mugger or marsh crocodile, gharial and turtles. The connectivity with Chambal Sanctuary should be studied, and some attention should be given to the conservation of these species in the area between Kuno Sanctuary and Chambal.
9. A dedicated sanctuary website should be developed to boost tourism. Material such as brochures and pamphlets should also be prepared for distribution to the public.

Evaluators
Dr. Alok Saxena, Former PCCF, Andaman & Nicobar Islands
Dr. Jayant Kulkarni, Independent Scientist, Pune
Shri Ajay Desai, Independent Biologist, Belgaum
Dr. Suresh Kumar, Scientist-E, WII

10. Madhav National Park, Madhya Pradesh
MEE Score- 76.60% (Very Good)

Management Strengths

1. The PA is rich in biodiversity and the park is being managed quite well.
2. Most of the villages have been relocated. Only few families reside inside the park.
3. The protection strategy is quite effective. Night patrolling is done regularly. Patrolling registers are maintained well.
4. The funds, manpower and other infrastructure are sufficient. Additional mobility is needed.
5. The Anubhooti programme for school children has good potential to bridge relationships with the people of Shivpuri city.

Management Weaknesses

1. The current management plan has expired, and there is no new plan in place. A new management plan is under process of preparation.
2. The existing plan does not integrate the site into a wider network though the PA is surrounded by a vast tract of reserved forest, connected with Kuno Palpur Wildlife Sanctuary and Panna Tiger Reserve on the east.
3. The involvement of NGOs and research activities is quite limited and needs to be strengthened.

Immediate Action Points

1. Madhav National Park has good potential for wildlife, birdwatching and historical tourism. There is a need for more publicity to boost tourism. Articles should be published in magazines such as *Sanctuary*, in newspapers and in in-flight magazines. Such articles should highlight the combined values of wildlife, bird life and historical monuments.
2. The Field Director of this PA was of the opinion that tigers should be reintroduced in this area as this area had tigers previously. At least a 'tiger safari' may be considered. The case for tiger reintroduction or a safari should be studied with the involvement of experts.
3. The PA management is carrying out grassland management, weed removal, controlled burning and related habitat improvement/development activities. Though the

activities are very positive and useful, the results are not being monitored scientifically. It is suggested that a research project be developed in collaboration with faculty members of the botany departments of local colleges to monitor the results of these activities. The outcome of various strategies such as grassland development, weed removal, brushwood removal and controlled burning should be studied and analyzed. The findings of the analysis should be disseminated in the form of scientific publications and internal notes of the forest department.

4. Some additional vehicles are needed to augment the protection efforts. One vehicle is needed for the Field Director independently and a bus for extension activities.
5. The results of line transect monitoring should be analysed to generate data on the densities of herbivores.
6. A proposal to increase the size of the sanctuary by including some forest blocks from Shivpuri Division should be considered.
7. The relocation process should be completed as soon as possible.
8. There should be more positive interactions with the people of Shivpuri city. A joint committee should be established to solve the problems of the sanctuary such as sewage treatment, encroachment and unplanned development along the sanctuary boundary that are associated with Kuno city.
9. A suitable eco-sensitive zone should be identified for the sanctuary. On the city side, to the west of the sanctuary, plantation activities should be carried out. Other strategies should also be studied to mitigate the effects of the hard edge with the city.
10. The inflow of sewage to Sakya Lake and the water quality there should be monitored regularly.

Evaluators
Dr. Alok Saxena, Former PCCF, Andaman & Nicobar Islands
Dr. Jayant Kulkarni, Independent Scientist, Pune
Shri Ajay Desai, Independent Biologist, Belgaum
Dr. Suresh Kumar, Scientist-E, WII

11. Pachmarhi Wildlife Sanctuary, Madhya Pradesh

MEE Score- 80.83% (Very Good)

Management Strengths

1. The sanctuary is well managed. It is a part of Satpura Tiger Reserve, and management interventions are carried out as per the Tiger Conservation Plan (TCP) of Satpura Tiger Reserve. Funds are therefore not a constraint.
2. The TCP of Satpura Tiger Reserve is well written. All the values are clearly identified, and there is a plan to protect them.
3. Relocation of villages has been beneficial for the sanctuary and has helped improve the habitat.
4. There are 39 villages in and around this PA. Eleven of these villages have been excluded according to the directions of the Centrally Empowered Committee (CEC). Of the other 28 villages, 16 have been relocated successfully. In two villages, there are no human habitations. The process of relocation of the remaining villages is in progress. This PA has received a national award for the best relocation done in a PA.
5. The chain link fencing in Matkuli Forest Range has been effective in reducing human–wildlife conflicts and offences.
6. The officers of this PA are very dedicated, and many of them have received awards at different levels. This PA has also received the Best Managed PA Award from the state government.
7. It is good to note that short-term training programmes are organised for the field staff.

8. The grassland development programme initiated by the PA management is to be appreciated.
9. A number of NGOs support this PA.
10. The tourist facilities are adequate and are well maintained.

Management Weaknesses

1. Presence of monkey populations around the places where there are tourists is a big menace. The number of monkey bite cases is increasing.
2. Lakhs of pilgrims visit the sanctuary, and this poses a serious threat to conservation. It is really difficult to control the damage caused to the ecosystem by such large numbers of people.
3. The protection efforts are affected by the lack of sufficient manpower, mobility and equipment. The PA needs additional manpower in frontline staff, motor bikes (at least 10), night vision binoculars, cameras, etc.
4. Clear information on wildlife populations is lacking because the forest staff do not possess analytical abilities. They need training in methods used to conduct censuses and in analysis of the data gathered.

Immediate Action Points

1. The presence of Pachmarhi Cantonment inside the sanctuary area is a problem. However, there is scope for tree plantation in the open spaces in Pachmarhi city. This can be done with the help of the cantonment board.

2. The forest department should prepare an action plan to deal with the monkey menace.
3. To protect the ecosystem from the damage being inflicted by the large number of pilgrims visiting the area during Mahashivratri, the forest department may consider consulting the religious heads about the possibility of shifting the shrines to some place outside. This is of course an extremely difficult suggestion as these shrines have historical significance.

Evaluators

Dr. Alok Saxena, Former PCCF, Andaman & Nicobar Islands
Dr. Jayant Kulkarni, Independent Scientist, Pune
Shri Ajay Desai, Independent Biologist, Belgaum
Dr. Suresh Kumar, Scientist-E, WII

12. Ralamandal Wildlife Sanctuary, Madhya Pradesh

MEE Score- 68.33% (Good)

Management Strengths

1. The extent of the sanctuary is small (2.35 km^2), but it is well managed.
2. The sanctuary is well protected. There are no encroachments, and there are no habitations inside the PA. The entire sanctuary is fenced.
3. A new management plan (draft) has been prepared for the period from 2017–18 to 2017–28. The sanctuary has been demarcated into three zones: (i) a wildlife zone (ii) a tourist zone and (ii) a deer safari zone.
4. A lot of work is done on nature education, recreation and awareness generation.
5. Being very close to the city of Indore, the sanctuary attracts tourists in good numbers. During the last five years, the average number of tourists visiting annually has been around 60,000, and the average revenue collection in development fund has been more than Rs.20,00,000.
6. There are many attractions for tourists:

a. A wildlife awareness centre (Vanya Prani Chetna Kendra)
b. The Narmada Fossil Museum, which exhibits dinosaur fossils
c. A deer park with a battery-operated golf cart for tourists
d. A children's park
e. A pagoda for tourists
f. A nature trail
g. A *shikargah* (hunting place) constructed in 1905 by Maharaja Shivajirao Holkar—now converted into a museum for wildlife and the history of the Holkar dynasty.

7. The PA has a wildlife rescue team that is entrusted with the responsibility of rescuing wild animals from Indore, Khandwa and Ujjain circles. These rescued animals are later released in their natural habitat. In the last five years, this rescue team has conducted 247 rescue operations and rescued 1013 wild animals.

Management Weaknesses

1. No major weaknesses were observed. The protection efforts can be improved. Presently there is only one camp, with a limited staff strength. Even so, patrolling is carried out daily during the daytime. Occasionally, night patrolling is conducted. With additional members on the staff, the frequency of night patrolling can be increased.
2. Participation of the public in the planning process is lacking.
3. NGO involvement is also lacking.

Immediate Action Points

1. The draft management plan is poorly written. There is a considerable scope for improvement.
2. To augment awareness efforts, the PA authorities should develop a strong plan for educational programme with schools and colleges of Indore. NGOs can also be roped in for the purpose.
3. There should be one or two posts of naturalist to implement the education plan.
4. Brochures are available, but more publicity efforts are needed to increase the inflow of visitors.

Evaluators
Dr. Alok Saxena, Former PCCF, Andaman & Nicobar Islands
Dr. Jayant Kulkarni, Independent Scientist, Pune
Shri Ajay Desai, Independent Biologist, Belgaum
Dr. Suresh Kumar, Scientist-E, WII

13. Sailana Wildlife Sanctuary, Madhya Pradesh

MEE Score- 64.29% (Good)

Management Strengths

1. This is a small sanctuary (13 km² in area) established with the single objective of conservation of the lesser florican (*Sypheotides indicus*),locally known as the *kharmor*. Some other rare migratory birds also visit this area.
2. Management plans are regularly prepared and updated. The new management plan is valid till 2017–28.
3. There is a *kharmor* reward scheme whereby any person who reports the presence of floricans is rewarded with Rs.1000 and farmers who find floricans on their lands are rewarded with Rs.5000.

Management Weaknesses

1. Lesser floricans are found mainly on the revenue land that forms a part of the sanctuary. Changes in the agriculture pattern are leading to a decline in the population of this bird.
2. Since the revenue land is now a part of the notified sanctuary and the local people are unable to sell or buy land in this area, they are not co-operating with the forest department.
3. The presence of a large number of nilgai is a threat because these animals may trample on florican eggs.
4. Windmills are very noisy at night and act as a source of disturbance to the floricans. However, now that they are already erected, it is difficult to remove them.
5. A large number of cement bunds have been created across streams as a water conservation measure. This measure appears to be unnecessary and wasteful.
6. The tourism in the sanctuary is negligible.
7. No NGO or research organisation is currently involved in research or awareness-generation activities.

Immediate Action Points

1. The area needs to be fenced, and efforts should be made to remove nilgai during the season when the lesser floricans visit this area.
2. The forest department should take up grassland development and raise leguminous plants like soyabean in this area.
3. In the vicinity of this area, there are important places of tourist interest. The PA management should therefore make efforts to give wide publicity so that tourists visit the sanctuary.
4. Since the local farmers are quite hostile towards the forest department because of their bringing revenue land within the sanctuary, the department may consider engaging a reputed NGO for generating awareness among farmers and seeking their support for conservation efforts.
5. The department may also consider providing incentives to those farmers who raise leguminous crops or such species that draw lesser floricans.

Evaluators
Dr. Alok Saxena, Former PCCF, Andaman & Nicobar Islands
Dr. Jayant Kulkarni, Independent Scientist, Pune
Shri Ajay Desai, Independent Biologist, Belgaum
Dr. Suresh Kumar, Scientist-E, WII

14. Sardarpur Wildlife Sanctuary, Madhya Pradesh

MEE Score- 50.89% (Fair)

Management Strengths

1. This is a comparatively large sanctuary, with an area of 20343.911 ha. The extent of the forest area however, is only 584.233 ha. The remaining area (19759.678 ha) comprises revenue and private land. This is a unique PA in which most of the area (approximately 97.5%) is privately owned or falls under revenue land. Only 2.5% of area is under forests.
2. Like Sailana Bird Sanctuary, the management of this PA is oriented towards the conservation of a single species, i.e., the *kharmor* (lesser florican, *Sypheotides indicus*). Since 2002–03, there has been no sighting of this bird in this PA. However, due to the protection efforts of the forest department, one pair was sighted in 2017, and then in 2018, 11 pairs were sighted.

3. The entire forest area has been fenced. This has resulted in better protection of the meadows and in the area having been made free of biotic pressure.

Management Weaknesses

1. No sightings are recorded in the revenue area. Earlier, lesser floricans used to visit the forest area, but due to changes in agricultural practices and in the crop composition, the habitat of the floricans has been affected adversely.Earlier the main crops cultivated in the rainy season were *moong* and *urad*. Nowadays they are soyabean, tomato and cotton.Earlier, there were private grass meadows (*beeds*) where floricans were found. Now most of these meadows have been converted, mostly to agriculture.
2. There is an increase in the use of pesticides, and as a result, the floricans do not get insects, which is their main food. Pesticides can also cause thinning of egg shells, resulting in high egg mortality.
3. There is pressure of cattle grazing on the forest area. People graze their cattle in these areas at every opportunity. People are allowed to cut grass and take it away after the floricans have gone.
4. The local farmers are quite hostile towards the forest department because a large part of their private lands has become a part of the sanctuary after its notification. Now they cannot carry out any land transaction when they need money.
5. No efforts are made by the department to encourage tourism, research and awareness-generation programmes.

Immediate Action Points

1. It is suggested that people be allowed to graze their livestock after the floricans have gone. This way the dung of the livestock will enrich the soil. Some trials of rotational grazing could be conducted.
2. Organic farming should be encouraged. The use of pesticides should be discouraged.
3. People should be encouraged to grow *urad* and *moong* and to raise grasslands. Some incentives should be provided for these activities.
4. The forest department may explore means of amending the notification to include provisions for land transactions in genuine cases.
5. The forest department should encourage tourism, research and awareness-generation programmes.
6. Research activities on other animal species found in the sanctuary should be encouraged and their management should also be considered.

Evaluators

Dr. Alok Saxena, Former PCCF, Andaman & Nicobar Islands
Dr. Jayant Kulkarni, Independent Scientist, Pune
Shri Ajay Desai, Independent Biologist, Belgaum
Dr. Suresh Kumar, Scientist-E, WII

15. Singhori Wildlife Sanctuary, Madhya Pradesh

MEE Score- 56.03% (Fair)

Management Strengths

1. The biodiversity of Singhori Wildlife Sanctuary, spread over an area of 288 km^2, is quite rich, in terms plant and animal biodiversity.
2. The protection efforts of the staff are appreciable even though the human resources are limited. All the staff members, including chowkidars, are assigned protection duty.
3. Patrolling is done daily as per schedule. Even night patrolling is done frequently

Management Weaknesses

1. There are 22 villages inside the sanctuary and 195 villages on the periphery. As a result, there is heavy biotic pressure on this sanctuary.
2. The main threat is illegal felling and removal of trees from the sanctuary. Removal is done using motor bikes after conversion of trees into logs and small beams. The limited nature of human resources is a big constraint in curbing forest offences. The extent of occurrence of wildlife offences is not much.
3. There are 37 EDCs, but only a few are active, and the others are not very keen to cooperate with the authorities of the PA.
4. The available funds are inadequate, and the manpower and infrastructure are also insufficient. The mobility of staff is hampered by the small number of vehicles available.
5. There is no vehicle with the park management for transportation of seized materials.
6. No NGO or research organisation is working with the PA management.
7. The budget is a real constraint. Only 35% of the budget demanded is provided.
8. Tourism in the sanctuary is negligible. There are no facilities except for two forest rest houses, which can accommodate only a limited number of people.

Immediate Action Points

1. The highest priority is to be given to providing the additional staff members for improving the patrolling efforts because illicit felling and removal of timber have increased.
2. More funds should be provided for protection efforts as well as for improving the infrastructure.
3. The vehicle requirement of the PA for necessary mobility and for transportation of seized material should be assessed and the required number of vehicles provided.
4. The frontline staff should be trained in wildlife management. Some short training courses can be arranged for conducting wildlife censuses and on related topics.
5. Awareness generation efforts should be strengthened. The forest department can take the help of a reputed NGO for this.

Evaluators
Dr. Alok Saxena, Former PCCF, Andaman & Nicobar Islands
Dr. Jayant Kulkarni, Independent Scientist, Pune
Shri Ajay Desai, Independent Biologist, Belgaum
Dr. Suresh Kumar, Scientist-E, WII

16. Son Gharial Wildlife Sanctuary, Madhya Pradesh

MEE Score- 63.33% (Good)

Management Strengths

1. This is the second largest riverine sanctuary in Madhya Pradesh. It was declared a wildlife sanctuary in 1981 with the objective of protecting and preserving the faunal diversity of the river, specifically the critically endangered Gharial (*Gavialis gangeticus*). A stretch of 210 km including 161 km of the river Son, 23 km of the river Banas and 26 km of the river Gopad, in Madya Pradesh, forms the Son Gharial Wildlife Sanctuary (SGS). A strip of land of width 200 m on either side is also included in the sanctuary. It is an ideal site for crocodile breeding and conservation of aquatic fauna.
2. There is good potential for eco-tourism at the site.
3. The forest department is taking good measures for conservation of crocodiles. The protection efforts, though limited due to paucity of manpower and infrastructure, are effective. The PA management has recently constructed a hatchery to protect crocodile eggs from stray dogs and other predators.

4. The EDCs and villagers, by and large, co-operate with the forest department in their protection efforts.

Management Weaknesses

1. One of the major threats to the sanctuary is from the limited water flow. There are two water extraction projects currently affecting the flow regime within the sanctuary. These are (i) the Bansagar dam, a major reservoir situated at the junction of Shahdol, Satna, Katni and Umaria districts, of Madhya Pradesh and (ii) a smaller project, on the river Gopad, outside the sanctuary limits, at Nigri, for provision of water to the Jaypee Thermal Power Plant. The operations of these dams have drastically altered the flow regimes of the rivers Son and Gopad, in turn affecting the fauna of SGS.
2. There are 122 villages in and around SGS (102 villages inside and 20 villages on the periphery). Though the villagers are mostly co-operative, they complain of denial of access to water for their use and for fishing.
3. Illegal sand mining and fishing are among the major threats.
4. The problems are further aggravated because rights have not been settled and there is a lack of staff members for monitoring, lack of awareness among the villagers about the sanctuary, and lack of alternatives to reduce the extractive pressures on the resources within the sanctuary.
5. The stretch is too long to provide effective protection as the available manpower and infrastructure (and funds) are limited.
6. The existing management plan expired in 2014–15. It wasr extended till 2019, but no new management plan is in place. The MEE team was informed that a new management plan is being prepared, but no draft could be shown.
7. Very limited efforts are being made to promote tourism.
8. There is no initiative to generate awareness.

Immediate Action Points

1. The PA management should make all efforts to ensure proper water inflow into the river. There should be regular communication between the sanctuary authorities and the authorities of Bansagar dam, and there should be an agreement to release a minimum quantity of water on a continuous and regular basis.
2. As a follow-up of an order of the NGT, some additional staff members have been provided to the PA, but even more manpower is required to afford protection to the area effectively and to deal with the sand mafia.
3. A hatchery has been constructed recently for rearing crocodile eggs. More such hatcheries are needed.
4. The present hatchery is closed from the top. The PA management should consult a technical expert regarding this as providing shade to a nest may alter the temperature, which may affect the sex ratio of the hatchlings. It is a known fact that changes in the temperature of reptile eggs may influence the sex determination of hatchlings. In Cuthbert Bay (Crocodile) Sanctuary in the Andaman and Nicobar Islands, all the hatcheries constructed by the forest department are fenced but open above so that the nests remain protected from predators but the temperature is not affected.
5. The river Son joins the Ganga at Patna. The river flows through approximately 200 km in Uttar Pradesh and 400 km in Bihar according to the SDO. Much of the wildlife, such as gharial and dolphins, will come from the river Ganga. For the sanctuary to be integrated with the larger landscape, there should be a sanctuary in the Uttar Pradesh stretch and the Bihar stretch of the river. There is a good case for creating an inter-state sanctuary. An example of such a sanctuary is seen in the Chambal Sanctuary, which stretches across three states, Rajasthan, Madhya Pradesh and Uttar Pradesh.

However, before the inter-sanctuary is created, WII or any suitable agency should carry out a rapid study on the gharial and aquatic fauna, and on various threats in Uttar Pradesh and Bihar and make a firm recommendation about the appropriate course of action.

6. Other aquatic wildlife such as turtles, the mugger, and avifauna should be given due importance in the management of the sanctuary. The presence of skimmers in the river is very interesting, and their habitat should be protected well.
7. There should be more publicity about the sanctuary, and tourism should be strengthened, especially the nature guide programme.
8. Research activities should also be promoted through reputed institutes and universities, and through NGOs.

Evaluators
Dr. Alok Saxena, Former PCCF, Andaman & Nicobar Islands
Dr. Jayant Kulkarni, Independent Scientist, Pune
Shri Ajay Desai, Independent Biologist, Belgaum
Dr. Suresh Kumar, Scientist-E, WII

17. Veerangana Durgavati Wildlife Sanctuary, Madhya Pradesh
MEE Score- 67.24% (Good)

Management Strengths

1. Though this sanctuary is relatively small in size (23.9 km^2), it is surrounded by the dense forests of Damoh Forest Division. It is also connected to Panna Tiger Reserve and serves as a corridor for tiger movement. During the visit of the MEE team, one tiger from Panna Tiger Reserve was reported in the sanctuary area.
2. The area is rich in biodiversity including rich avian diversity. The wildlife consists of mostly herbivores. There are good numbers of vulture nests in some parts of the PA.
3. The area is free of encroachments, and there are no settlements inside the sanctuary.
4. No incidences of fire have been reported in the last three years, and no forest or wildlife offences have been reported either.
5. The area has historical significance as is indicated by its name. Singorgarh Fort is situated inside this PA. The fort was built in 1357 by the then ruler Shri Gaj Singh Parihar. Two centuries later, the area was ruled by Rani Durgavati after the death of her husband, King Dalpat Shah. This kingdom was attacked by the Mughal Subedar, Asif Khan. Rani Durgavati fought with great valour but lost. The sanctuary is named in the memory of the brave queen.
6. There are many places of tourist interest inside the PA: Nidan Waterfall, Alowni Wall, View Point, Singorgarh Fort, Danital (lake), Ratankund, Jogankund, Bhadbhada, Bavanbajaria etc. There are three tourist routes of different distances, leading to different locations. There is also a walking trail to Singorgarh Fort and Ratankund.

Management Weaknesses

1. In spite of the historical importance of this PA, it is relatively unknown. Even some officers of the Madhya Pradesh Forest Department are not aware of it.
2. The first management plan of the PA expired in 2016-17. No new management plan has been prepared, and only annual plans are being prepared over the last three years.
3. The sanctuary has tremendous tourism potential, but the tourists are mostly local people. They come here mainly for picnics and to enjoy the scenic beauty. Wildlife-related tourism is not popular.
4. There are 13 villages on the periphery of the PA, and this is the source of some biotic pressure on the PA—mainly firewood collection and cattle grazing.

5. This PA is managed by Damoh Forest Division. There is no full-time Director and no earmarked staff. One can infer that this PA is quite neglected even though it is rich in forests and wildlife and commands historical significance.
6. The available human resources are not adequate for protecting the area. Trained manpower is lacking.
7. The involvement of NGOs is very limited.
8. No research activity is being taken up.
9. Two brochures with some information on this PA are available, but a dedicated website is lacking.

Immediate Action Points

1. The new management plan of this PA should be written without any further delay. The plan should include actions related to research activities, promotion of eco-tourism, people's participation in management through EDCs, extension activities, etc. in addition to the ongoing conservation activities.
2. The new management plan should also describe the zonation in the PA and the activities in each zone.
3. The vulture nesting sites appear to be well protected, but more efforts are needed, particularly for continuous surveys and monitoring. A census was conducted by the BNHS in the past. The forest department may consider undertaking research related to the conservation of vultures that involves research institutes, NGOs, conservation organization or universities.
4. There should be a separate Field Director with a frontline staff of sufficient sanctioned strength.
5. Trained manpower should be made available to the PA to augment the protection measures.
6. Though the infrastructure is adequate, the PA needs camera traps to conduct censuses. The PA had four camera traps earlier but had to send them to Panna Tiger Reserve in accordance with directions from the headquarters.
7. Wide publicity is needed to augment the tourist inflow of the sanctuary.
8. The MEE team was informed that there is a proposal to increase the area of the PA to 211 km² by including parts of Damoh Division. This proposal was made 4 years ago. The PA authorities should follow up and get the notification issued at the earliest.

Evaluators
Dr. Alok Saxena, Former PCCF, Andaman & Nicobar Islands
Dr. Jayant Kulkarni, Independent Scientist, Pune
Shri Ajay Desai, Independent Biologist, Belgaum
Dr. Suresh Kumar, Scientist-E, WII

MAHARASHTRA

One of the team of Western Region carried out MEE of 11 NP&WLS. Among which, 3 NP&WLS have been rated as 'Very Good' and 8 NP&WLS rated in 'Good' category. Detailed report of each NP&WLS discussed separately. The specific recommendations in brief are given below:

1. Thungareshwar WLS: Restoration of the corridors connecting the PA with the larger landscape needs to be taken up with the Govt. on priority. The process of notification of Eco-Sensitive Zone (ESZ) for the PA needs to be expedited.

2. Thane Creek WLS: No new licenses should be given to the fishermen. Ecotourism needs to be promoted as a means of livelihood generation for the fishermen community.

3. Sanjay Gandhi National Park: Hawkers May be allowed only near the gate/ entry point and not deep inside the PA.
4. Nandur Madhmeshwar WLS: Rationalisation of the boundary needs to be done.
5. Yawal WLS: Final notification of the sanctuary needs to be issued at the earliest, as it is pending since 2014.
6. Panganga WLS: The Final notification of the sanctuary should be issued at the earliest. The 26 sq. km. block of forest in Kinwat Range and Godhri Forest division should be appended to Panganga WLS.
7. Yedshi Ramling WLS: The Railway Guest House needs to be brought under the control of Forest Department for administrative reasons because it is no more required by the Railways. The elevated road for the portion where Highway passes through the sanctuary may be built if found feasible.
8. Naigaon Peacock WLS: The W.I.I. May be requested for giving support in the population estimation of various species.
9. Mayureshwar WLS: Guzzlar system of Desert National Park, Rajasthan for providing water to the wild animals should be adopted and a team of officers/staff may be sent to DNP to see their system.
10. Tipeshwar WLS: One more Range may be created for administrative reasons as presently the entire sanctuary consists of only one Range.
11. Sagareshwer WLS: An MOU May be signed between the sanctuary officials and the Irrigation department for ensuring water availability throughout the year.

18. Mayureshwar Wildlife Sanctuary, Maharashtra
MEE Score- 75% (Very Good)

Management Strengths

1. It is a very compact and small wildlife sanctuary with a total area of 5.140 km^2.
2. The final notification of the sanctuary was issued on 27 August 1997.
3. An approved management plan is in place for the period from 2013–14 to 2022–23.
4. All the values are documented well in the management plan.
5. There are no villages inside the sanctuary, and it is easily accessible from the nearest city with an airport, Pune.
6. The staff and funds are sufficient.
7. Mayureshwar WLS (MWLS) is connected well with the adjoining landscape through territorial forests.
8. The Indian gazelle, the flagship species of MWLS, is easily sighted. Other wild animals such as the Indian wolf, other carnivores, sandgrouse and Indian courser are occasionally sighted.
9. The interpretation centre is functional and is used regularly.
10. The required visitor facilities, such as toilets, drinking water, dust bins and benches, are available.
11. There are two VFCs, and they are functional. The department has regular meetings with them.
12. Awareness programmes are being organized regularly (almost once a week) for school children.
13. There is an e-surveillance system in place.

14. Local and other NGOs support the management activities of MWLS and provide some RESOURCES (gadgets, dresses, shoes, water bottles, etc.) to the staff of the sanctuary.
15. Almost all the equipment needed for the management of the sanctuary has been procured. MWLS has an adequate number of vehicles for the staff.
16. Good signages are in place.
17. There is a souvenir shop.
18. There are two hides and four watch towers. These are used regularly by the visitors.
19. The sanctuary is an ideal habitat for conserving species of grassland ecosystems.
20. Three research projects, on the Indian wolf, hyaena, Indian fox and jungle cat are being conducted in MWLS and adjoining habitats.

Management Weaknesses

1. District roads from Supe to Vadhane and from Supe to Saswat, a state highway and NH 46 run close to the sanctuary.
2. There is livestock grazing in MWLS, and this is a major threat.
3. There is no systematic monitoring of the flora, fauna and ecosystems of MWLS.
4. There is no maintenance schedule.
5. The secret service fund is not utilized, and the intelligence gathering system has not been established well.
6. The mid-term review has not been initiated yet.
7. Stray dogs are present in the sanctuary. They pose a serious problem to the conservation of the Indian gazelle.
8. The participation of stakeholders in the management of the sanctuary is minimal.
9. Research reports/interim reports have not been utilized to improve the management of the sanctuary.

Immediate Actionable Points

1. A mid-term review needs to be started soon and should include monitoring of all the values of MWLS.
2. Separate zonation plans for each zone and landscape planning details need to be included in the management plan during the mid-term review.
3. The issue of grazing of sheep needs to be addressed.
4. The entry tickets should have do's and don'ts and the perforated portion of the feedback form printed on them.
5. Mapping of palatable food resources and restoration of these in MWLS are needed for the management of the flagship species of this landscape.
6. The Guzzler automatic filling system should be adopted, and a visit to Desert National Park, Rajasthan may be planned to study their system.
7. The website should be revived and updated at the earliest.
8. The publicity material should be translated into English and other languages and should be disseminated extensively, with the support of the state tourism department, at various tourist centres, railway stations, airports, etc.
9. Information about the management of the protected area may be incorporated in the publicity material and shared with the stakeholders.
10. Staff quarters need to be constructed soon for the field staff.
11. Necessary equipment such as rangefinders, additional camera traps and drones may be procured.
12. Permanent "line transects" may be laid out in the sanctuary for systematic and regular estimation and monitoring of the populations of the Indian gazelle and other species.
13. The approval of the extension plan of the sanctuary needs to be followed up and its execution expedited.

14. The Shyama Prasad Mukherji Rurban Mission should be implemented in the villages close to the sanctuary.
15. Some exclosures may be created for a grass seed bank of these grassland communities.
16. The 65-ha extent of land occupied by 24 families around the sanctuary needs to be acquired soon, and the families may be relocated to the adjacent forest areas by giving them an appropriate package.

Evaluators
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

19. Naigaon Peacock Wildlife Sanctuary,Maharashtra
MEE Score- 66.40% (Good)

Management Strengths
1. Naigaon Peacock Wildlife Sanctuary (NPWLS) was notified in 1994. It is a small PA interspersed with some areas of private lands.
2. This is the only sanctuary notified in Maharashtra for the protection of the peacock, the national bird.
3. The vegetation type here is dry deciduous scrub forest. It provides adequate protection to the flagship species—the peacock and blackbuck—of this ecosystem. The other wild animals include the wolf, hyaena, fox, barking deer, porcupine and wild cat. The avifauna of the sanctuary is also very rich.
4. The sanctuary is located in a drought-prone area. Therefore, the "ridge to valley" concept has been followed to conserve soil water. Water is also conserved by creating loose boulder check dams and gabion structures in *nalas*.
5. There is no habitation within the sanctuary, and all encroachments have been removed.
6. Fire lines of width 3–6 m and a total length of 241 km have been created around the entire boundary. Maintenance of the fire lines is carried out annually from February to June.
7. Eight EDCs have been constituted, and these are working actively.
8. Madarshah Dargah—the dargah of a religious person, Aulia Baba—is located in the sanctuary. He had considerable influence in the area. He used to preach to the local people to not kill peacocks even if they damaged their fields and to not cut any trees.
9. No hunting or poaching activities have been recorded.
10. There are three perennial water bodies within 1 km of the sanctuary.
11. Twenty-eight artificial waterholes have been created. These are replenished twice a month with water.
12. The sanctuary is the only green spot in Patoda Tehsil, of Beed District, and hence it is a popular tourist destination.
13. The tourist facilities consist of a rest house with two suites. There are six pairs of binoculars for tourists and bird watchers.
14. There are two watch towers and four vantage points (pergolas) with benches for tourists.
15. Five nature trails have been created.
16. Protection walls have been established around wells, and cattle-proof trenches have been dug.
17. The sanctuary has established a "Green Army" of 1400 people with active participation of the public to support the sanctuary management in carrying out plantation, conducting censuses, patrolling, fire fighting, etc. These people have been awarded certificates for their support.

18. There is an NGO called "Wildlife Protection and Sanctuary Association" that helps the department rescue injured animals. The NGO runs an orphanage.
19. The "My Government" website and 'Hello Forest' phone system support interactions with the public and address specific queries.
20. LPG gas connections have been given to the villagers through the UJJWALA scheme as well as the Shyama Prasad Mukherjee Yojana.
21. Every beat is checked once every 6 months, and a report of each beat is sent every 6 months to the APCCF.
22. The sanctuary has field equipment and a camera with a 600 mm telescopic lens.

Management Weaknesses

1. The sanctuary has private lands within it.
2. There are six villages and 12 *wadis* (hamlets) around the sanctuary. The total cattle population in these villages is above 16,000. These cattle need to graze inside the sanctuary.
3. There are no incidences of poaching inside the sanctuary, but there have been cases of poaching of blackbuck and haresby the Pardhi tribe outside the boundary.
4. State Highway 52 goes towards Patoda. There is heavy traffic on this highway, and this has led to causalities, mainly of blackbuck.
5. There is no nature interpretation centre in the sanctuary.
6. Due to the scanty rainfall of the area, there is a scarcity of food and water resources during summer.
7. This drought-prone area is covered with *kusali* grass. This grass, after getting dry in the summer, makes the area vulnerable to fires. The adjoining revenue area is also prone to fires, further increasing the vulnerability.
8. Sporadic incidents of illicit cutting of fuelwood have been recorded.
9. The sanctuary has no proper entry gate.
10. The boundary demarcation is not complete.

Immediate Actionable Points

1. A detailed project needs to be prepared to fixing boundary pillars all along the boundary in a phased manner.
2. Before the monsoon, profuse seeding of indigenous plant species should be done on trenches as well as on mounds.
3. A nature interpretation centre needs to be established and made functional at the earliest.
4. Signage has to be put up at the entry points, at viewpoints and on nature trails.
5. A speaking map of the sanctuary needs to be prepared that shows all the features, such as roads, *nalas*, office and residential buildings, temples, nature trails, etc.
6. Some camping sites may be developed with two or three tents, at suitable places, which may be rented out to tourists for eco-tourism.
7. Some core areas should be developed so that they have adequate food, water and shelter and animals can breed there.
8. More water holes need to be created to provide water to the wildlife during the pinch period. A visit to Desert National Park, Rajasthan may be organised for the staff to observe the most conservative and efficient way of water hole management.
9. The mini core zones and tourist zone may be marked on the map as well as on the ground, and the zonation plans should be prepared for each zone.
10. The *roznaamcha* register should be maintained for checking beats and the movements of staff members regularly.

11. Areas should be identified for fodder production for stall feeding the livestock of the surrounding areas so as to reduce the pressure of livestock grazing on the sanctuary.
12. The brochures and pamphlets of the sanctuary may be disseminated through the state tourism department.
13. The Wildlife Institute of India may be requested to provide support for estimating the populations of various species. The water hole counting system may be replaced with the line transect method.
14. Electric fences or cattle-proof trenches may be used in areas vulnerable to conflicts with villagers.
15. Public awareness programmes may be arranged for villagers to tell them about the significance and importance of this sanctuary.
16. A few hides need to be made around water holes for tourism.
17. A systematic assets inventory and maintenance schedules must be prepared and include as separate chapters in the mid-term evaluation report.
18. A dedicated website must be prepared for NPWLS, and details of all management activities taken must be provided in it.
19. A system for getting feedback and comments from the tourists may be developed, and the feedback/ comments may be analysed regularly. Action taken on the comments may be reported to the appropriate persons.
20. The intelligence gathering system needs to be strengthened, and the secret service fund is to be fully utilized.
21. Discussions may be held with departments of universities about carrying out management-oriented research for the sanctuary.
22. Chapters on the mid-term review, zonation and stakeholders' participation in the management activities may be added to the management plan.
23. Two entry gates are to be established (at Naigaon and Rahat Wadi) and made functional.
24. Informative brochures should be prepared that give information on various management activities of the sanctuary

Evaluators
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

20. Nandur Madhmeshwar Wildlife Sanctuary, Maharashtra
MEE Score- 64.60% (Good)

Management Strengths

1. This sanctuary is an Important Bird Area (IBA), identified by BirdLife International, lying along the Central Asian Flyway, providing a safe stopover for wintering and migrating birds.
2. Five hundred and thirty-six species of aquatic and terrestrial plants, eight species of mammal, 256 species of birds, 24 species of freshwater fishes and 41 species of butterflies have been recorded in the sanctuary.
3. Nandur Madhmeshwar Wildlife Sanctuary is easily approachable. It is located only 60 km away from Nashik and 150 km from Aurangabad.
4. The tourist facilities are adequate. Three hides and seven watch towers are available for birdwatching. Eco-huts and tent accommodation are also available. There are five shops selling eatables and souvenirs.

5. Ten *pakshimitras*—tourist guides equipped with binoculars and spotting scopes—are there to help the visitorswith bird identification and watching.
6. All the entry fees are given to the EDC.
7. Tourism provides benefits to local people. Around 100 people are given employment in the wildlife sanctuary during the touristseason, from October to March.
8. The sanctuary is connected to two rivers, the Godavrai and Kadwa. The water supply to the area is assured through the Dharne and Gangapur dams on the Godavari river.
9. The Godavari river supports many aquatic plants and animal species.
10. Nandur Madhmeshwar Wildlife Sanctuary has tremendous ecotourism potential.
11. The sanctuary provides ecosystem services such as food for cattle, regulates the hydrological regime, provides recreation and education and helps nutrient cycling and erosion control.
12. The sanctuary has a functional interpretation centre.
13. The annual water bird count shows that more than 30,000 water birds are seen every year.

Management Weaknesses

1. This wildlife sanctuary has not been finally notified.
2. In the proposal for the final notification of the sanctuary, the total area of 10012 ha has been reduced by 1198.657 ha.
3. There is no comprehensive management plan. There is only a 2-year management scheme that expired in 2017.
4. There is no coordination with the irrigation department.
5. A severe scarcity of water is experienced during summer.
6. Fertilizers are used in the surrounding fields, and eutrophication has resulted in algal blooms.
7. Illegal fishing is carried on inside sanctuary but this is mainly for consumption and not for commercial gains. There is no fish market nearby.
8. There is illegal grazing in which about 400 head of livestock from the 11 villages in the periphery are involved.
9. Land with an extent of 5.16 ha (out of the 55 ha of reserve forest) has been encroached on and is being used for farming. A proposal has been sent to the Collector under the FRA for taking action in this regard.
10. No signage is seen, and the checklist of birds has not been updated.
11. Invasive species of plant such as the water hyacinth and *Ipomoea* are reducing the open area available for water birds for swimming. *Leucaena* and *Parthenium* are also adversely impacting the site.
12. There is a shortage of staff members, and there is limited interaction with NGOs. Thus implementation of schemes and ensuring people's participation have been affected.
13. No systematic research projects are being conducted.
14. The issue of rationalization of the boundary has still not been resolved.

Immediate Actionable Points

1. The water quality of the sanctuary should be monitored every year.
2. A comprehensive management plan needs to be prepared through a participatory process and be approved at the earliest. The draft management plan must be put in the public domain. The management plan must contain chapters on the mid-term review, climate change, research priorities, baseline data, mapping assessments and creation and maintenance schedule.
3. A dedicated website should be created for the sanctuary.

4. The boundary needs to be rationalized and fencing (preferably a 5–6 feet high pukka wall) erected at strategic/vulnerable points to reduce the biotic pressure from the peripheral villages.
5. Roosting platforms and mounds need to be created, and *babool* trees should be planted on them for birds to nest on.
6. Research priorities may be identified with the help of SACON and BNHS and participatory approaches need to be adopted for people's participation in research activities.
7. A team of officers from the sanctuary should visit Corbett Tiger Reserve to learn and implement the e-surveillance system used there for protection purposes.
8. The villagers in the periphery need to be sensitized about conservation and their use of resources from the sanctuary reduced.
9. The existing interpretation centre and tourist accommodation should be improved/strengthened to harness the tourism potential of the area.
10. Brochures about the sanctuary may be prepared in Hindi/English and made available at various tourist offices, airports, railway stations, hotels, etc.
11. Encroachers whose leases have not been renewed must be removed forthwith.
12. Three more spotting scopes, one motor boat, two airboats and a long range e-surveillance system need to be procured.
13. The entry tickets must have feedback forms that may be dropped by the visitors in a box placed on the gate, when they return from the sanctuary.
14. The comments in the register need to be analysed at regular intervals.
15. Efforts need to be made to have greater involvement of all the EDCs.
16. A visit to the Thane Creek interpretation center should be organized for the staff so that similar facilities can be developed at the interpretation centre.
17. The use of drones to monitor the water bird populations may be considered.
18. Efforts must be made to get the sanctuary notified as a Ramsar site at the earliest.

Evaluators
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

21. Painganga Wildlife Sanctuary
MEE Score- 62.06% (Good)

Management Strengths

1. The total forest area included in Painganga Wildlife Sanctuary is 324.62 km^2.
2. An adequate number of staff members have been posted in the sanctuary as per the sanctioned posts.
3. The sanctuary is being managed as per the management plan (2016–17 to 2025–26) approved by the Chief Wildlife Warden.
4. The vehicle strength is adequate. It includes six vehicles, two for the DFO and ACF and four for RFOs (one Xenon and three campers).
5. The sanctuary is easily approachable. It is located 280 km from Nagpur and 93 km from Adilabad, Telangana.
6. There is an adequate network of fair-weather roads for patrolling inside the sanctuary. Twenty patrolling camps, including eight check posts, are functional.
7. The sanctuary has 27 EDCs that are functioning.
8. It has good forest cover. The habitat is of a teak-dominated dry deciduous type. The level of invasion by weeds in the sanctuary is negligible.
9. Thirty-five good quantity firefighting blowers are available for firefighting operations.

10. There are more than 20 water holes along the course of the Painganga river. These are perennial water sources.
11. The Painganga is connected with the Nanded territorial forest division on the east and south and with the Pusad territorial forest division on the north and west. It is therefore well connected with other forests.

Management Weaknesses

1. The final notification of this sanctuary has not been issued.
2. The sanctuary borders are not clearly demarcated. The borders are porous. Boundary pillars have been erected along the boundary of the park, but not along the entire length. The task of erecting pillars has yet to be completed.
3. Fourteen villages are situated inside the sanctuary, exerting lot of human and biotic pressure on the sanctuary.
4. About 50% of the forest is under plantations, which is not very suitable for the ungulates.
5. The infrastructure is inadequate for the field staff, and the facilities at the protection camps (water, lights, cots, fencing) are poor.
6. There is no interpretation centre, and no facilities are available for eco-tourism.
7. There is little tourism due to the low density of the wildlife and the lack of facilities for tourists.
8. No signage has been put up inside the sanctuary or near the gate.
9. There is a dearth of staff at the range level to handle routine administrative duties.
10. The staff and officers from the DFO level downwards are not trained, though the CCF (Pench Tiger Reserve) is trained and has a WII diploma.
11. Sand is being extracted illegally from the Painganga river for construction of houses.
12. There is a lot of illegal tree felling in peripheral areas along the course of the river.
13. There is intense grazing pressure due to the numerous villages on the periphery.

Immediate Actionable Points

1. The final notification of the sanctuary must be expedited.
2. The 26 km² block of forest in Kinwat Range and Godhri Forest Division should be appended to Painganga Wildlife Sanctuary.
3. The corridor between Tipeshwar Wildlife Sanctuary, Painganga Wildlife Sanctuary and Kawal Tiger Reserve, in Telangana, may be systematically studied and strengthened so that the entire area may be managed according to landscape principles.
4. Shifting and rehabilitation of the villages of Ekamba, Sandabi, Paroti and Jevrala should be taken up on top priority to create an undisturbed forest for the sanctuary.
5. Kharbi Range needs to be divided into two ranges for effective management and protection, and vacant posts need to be filled up at the earliest.
6. Strengthening of the protection mechanism and construction of fully equipped protection camps with wireless systems may be done.
7. A dedicated website is needed for Painganga Wildlife Sanctuary from which tourists can obtain information easily.
8. One Lower Division Clerk with knowledge of accounting may be sanctioned for each range.
9. An interpretation centre should be developed in accordance with a tourism plan for eco-tourism.
10. Basic tourist facilities need to be created in the sanctuary.
11. Small surveys are to be conducted on various aspects of the flora and fauna so that a research and monitoring programme may be begun.

12. Eco-development activities need to be taken up through EDCs in the adjacent villages. Stall feeding may be encouraged along with distribution of productive high-yielding cattle to the villagers.

Evaluators
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

22. Sagareshwar Wildlife Sanctuary, Maharashtra
MEE Score- 71.50% (Good)

Management Strengths

1. Sagareshwar Wildlife Sanctuary (SWS), Kolhapur Wildlife Division is an almost entirely man-made sanctuary. A total of 116 animals including sambhar, chital, blackbuck and barking deer were brought from Chandrapur and Bhimashankar. The area was a deer park earlier. It was declared a game reserve in 1980 and a wildlife sanctuary in 1985 (through notification No. WLP/1085/CR-588/VII/F-5 dated 16 September 1985), with a compact extent of 10.87 km^2.
2. An approved management plan of SWS is in place for the period 2013–14 to 2022–23. SWS is fully surrounded by agricultural fields, and the major crops are sugarcane, grape and banana. The sanctuary is well protected from human disturbance by a 12-foot-high chain-link fence. A length of 37.395 km of the boundary (total perimeter 38.955 km) is fenced. The remaining length has been kept unfenced intentionally to permit the movement of animals.
3. The management plan is well written and has all the prescriptions for managing the sanctuary. The sanctuary has well demarcated zones, viz. core, restoration, administrative and tourism zones. All the zones have their zonation plans also.
4. SWS is well connected by road, rail and air throughout the year. It is 46 km from Sangli, 20 km from Islampur and 35 km from Karad. It is well connected by air through Kolhapur, which is only 75 km away, and through Pune, which is around 200 km away.
5. Mobile phone services are available throughout the sanctuary.
6. There are no villages inside the sanctuary, and an eco-sensitive zone has been notified.
7. The sanctuary is well connected to the adjoining area through territorial forests.
8. Water availability for wild animals is assured throughout the year through the Takari Lift Irrigation Scheme from the Krishna river, artificial water holes, check dams and various nullahs running inside the sanctuary.
9. The sanctuary has fire fighting equipment at the range level. The available equipment includes fire fighting blowers (five), grass cutters (three) and water spray pumps (15). This equipment is adequate to deal with the problem of fire.
10. SWS has internal surfaced roads with a total length of 13.640 km that can be used for protection and tourism purposes throughout the year.
11. The staff strength is adequate. There is one RFO, one Forester, 16 Forest Guards, 4 Van Majoors and one LDC.
12. The funds are adequate and are utilized. SWS received amounts of Rs.33.49 lakhs and Rs.82.89 lakhs under the CSS and DPTC schemes, respectively.
13. The sanctuary is well connected by road and rail all through the year and has important religious places, viz. The Kamalbhairav and Lingeshwara temples, which attract large numbers of tourists each year. Besides, the sanctuary also has a complex of 51 temples dating back to the Satavahana period.

14. The nature education centre is functional.
15. There is well established tourist accommodation, and there are viewing points in the sanctuary.
16. The signage is good and is distributed across the sanctuary.
17. Because SWS is a pilgrimage place, police support, including a lady officer, is availed of during festivals.
18. Forty-four wallowing sites are maintained and are kept free of disturbance.
19. MSTrIPES is used and data analysis is carried out for regular monitoring of the ecological parameters and the extent of poaching in SWS.
20. Sufficient natural food is available for the wildlife.

Management Weaknesses

1. The sanctuary is situated in the low rainfall zone of the state of Maharashtra and lacks perennial water sources. The availability of water in the sanctuary is dependent on the availability of water from the Krishna river (lift irrigation) of the Department of Irrigation. There is a scarcity of water sometimes in summer.
2. The major part of the sanctuary is chain-link fenced and surrounded by agricultural areas. Hence there is no scope for expanding the extent of the sanctuary.
3. There is no systematic database of the flora and fauna of the sanctuary, and there is no regular monitoring of the population status.
4. Stray dogs of the surrounding villages are the major problem of the sanctuary.
5. The sanctuary is very fire-prone.
6. The sanctuary is a religious place because of the Kamalbhairav and Lingeshwara temples, and so the management of tourists with the existing staff during festivals becomes difficult.
7. There is no staff member trained in wildlife management in the sanctuary.
8. A pukka road passes through the sanctuary, dividing the area into two and making it difficult for the wild animals to move from one part to the other.

Immediate Actionable Points

1. Because there are religious places in the sanctuary, additional staff members are required to manage tourists during festivals.
2. At places there is nothing on the top of the chain-link fencing, making it vulnerable to damage. Iron angles should, therefore, be installed at such places or similar measures taken to strengthen the fence.
3. Stakeholders' meetings may be held with the villagers, NGOs and Honorary Wildlife Wardens before the mid-term evaluation and the feasible suggestions/recommendations may be incorporated in the management plan.
4. Area-specific and need-based research studies may be conducted by outsourcing such studies to the WII, BNHS, universities, NGOs, etc.
5. WII may be requested to conduct 1-week training courses for the lower staff of the sanctuary.
6. Nature awareness workshops and field visits may be organized for the villagers living in the periphery to make them aware about nature conservation.
7. SWS is the home of the *ran-mung* and *ran-urad* crops, which are ancestors of cultivated varieties. Conservation of the germplasm is essential for use in the future. The sanctuary may be declared a heritage site for agri-biodiversity.
8. The sambhar present outside the sanctuary may be translocated into it.
9. The grass patches of the territorial forests may be developed and improved (in consultation with the DFO) so that the blackbuck are contained there and do not damage the fields of the villagers.

10. Removal of lantana from the sanctuary may be carried out after the rains using monkey- jacks and plants of palatable species may be planted.
11. Overpasses, underpasses or box culverts may be constructed to permit animals to move from one portion to the other.
12. The temples located inside the sanctuary may be delineated by internal boundaries and videography done in the presence of the pujaris. It must be ensured that no extension takes place.
13. The 2-ha extent of pasture land of Kundal village may be acquired through the due procedures.
14. Some seating benches, dust bins, water facilities, toilets, etc. need to be installed at the three viewpoints. The glossy stainless railings may be replaced with strong iron railings painted green.
15. Adequate safety measures may be taken up for the tourists visiting various temples.
16. The management plan needs to be translated into the local vernacular language for the benefit of the lower field staff.
17. The zonation needs to be indicatedon the map and also demarcated on the ground.
18. Some more camera traps and a drone may be procured for monitoring and protection.
19. Since the sanctuary has *Gliricidia* plantations, restoration of the habitat must be carried out in consultation with experts through plantation of native palatable fodder grass or plant species.
20. Support must be obtained from local and national NGOs such as WWF and BNHS in dealing with wildlife offences. Wildlife cases must be documented systematically.
21. The National Wildlife Action Plan has suggested that the irrigation department should provide water to the sanctuary throughout the year. An MOU may be signed between the sanctuary officials and the irrigation department to ensure that water is available throughout the year.
22. An independent proposal may be prepared to ensure that water from the Krishna river is made available throughout the year through lift irrigation.
23. A chapter on the mid-term review may be included in the management plan.
24. A plan to reduce the dog menace in the sanctuary may be prepared and implemented.
25. Because the area is fire-prone, the staff should be trained in fire management regularly.
26. The water quality should be monitored regularly.
27. Brochures need to be prepared in both Hindi and English.
28. The use of MSTrIPES for regular monitoring of ecological parameters and the extent of poaching in SWS is recommended.
29. Awards should be presented to staff members for exemplary work.
30. Publicity material should be distributed at places of tourist interest in the state.
31. Training of EDC members in hospitality management for self-employment should be planned.

<u>Evaluators</u>
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

23. Sanjay Gandhi National Park, Maharashtra
MEE Score- 75.80% (Very Good)

Management Strengths

1. Sanjay Gandhi National Park (SGNP) is a notified national park with a total notified area of 86.96 km² and a non-notified area of 16.72 km² (as per the order of the High Court).
2. The biodiversity of the park is very rich. More than 1300 species have been recorded here.
3. SGNP has one of the highest recorded densities of leopards in any protected area in the world. About 48 adults and 11 subadults were recorded in 2018.
4. About 40% of the periphery has been fenced with a 10-foot high pukka wall.
5. The ESZ was notified in 2016.
6. The staff strength is adequate. There are one CCF, two DFOs, four ACFs and four RFOs, besides sufficient numbers ofForesters and Forest Guards, as well as a 203-strong permanent labour force, working mostly in the tourism zone.
7. The park has many permanent water sources, including two lakes (the Vihar and Tulsi lakes) and a few perennial springs. It also has 32 seasonal springs, and four rivers (the Mithi, Poisar, Dahisar and Oshiwara) originate from this park. Water is available in SGNP till about February.
8. All the lower staff up to the Forest Guards are provided with mobile phones and are covered under the CUG.
9. There are two functional EDCs. These are in Yeur and Nagla blocks.
10. There is a proficient rescue team with state-of-the-art equipment. There is also a veterinary health care centre cum captive breeding facility for the rusty-spotted cat.
11. The park receives excellent cooperation from NGOs and civil society. The Bombay Environmental Action Group (BEAG), Conservation Action Trust (CAT), Bombay Natural History Society (BNHS), Tata Trust, Wildlife and We, and Wildlife Conservation Trust (WCT) support the park actively.
12. Adequate funds are available for protection, conservation, research and development works.
13. The park is easily approachable, being close to the cities of Mumbai and Thane. It provides an excellent eco-tourism destination, a good recreational area and 'green lungs' for the urban megalopolis.
14. The Kanheri caves, historical Buddhist caves of archaeological and religious importance, are situated within the park.
15. A public ledger account is available and is in operation that allows all the funds generated by SGNP to be ploughed back into its management and development works.
16. Public participation in fringes is very good.
17. About 40,000 families have been evicted from encroachments and 11,000 of them rehabilitated.

Management Weaknesses

1. Because of its proximity to the city, the park is honeycombed with encroachments. About 25,000 families are still present as encroachers on the periphery.
2. Around 1900 families are living in hamlets inside the park. Of these, 31 families are in the core area.
3. Unregulated hawkers put up stalls on the roadside, causing a lot of disturbance to the free movement of wildlife.
4. Many stray dogs roam around inside the park, posing a serious threat to the young ones of deer and other small animals.

5. Weeds such as *Eupatorium, Gliricidia*and *Chromolaena odorata* have invaded the park.
6. There is a lot of local political interference in the functioning of the management.
7. Trespassing by the public into core areas of the park is a serious issue.
8. Garbage accumulation on the periphery of the park (caused by encroachments, adjacent buildings and a lack of proper disposal facilities in the city) is a menace.
9. Irresponsible media coverage sometimes exacerbates the conflict with wildlife and thus interferes with management decision making.
10. The veterinary hospital has meagre and basic equipment. It does not have a dedicated building although one is being planned.
11. The staff quarters are inadequate for the entire staff, and therefore some staff members have to commute long distances.
12. The division office is susceptible to flooding in the monsoons, when the Dahisar river is in spate.

Immediate Actionable Points

1. Efforts must be made to expedite the court proceedings to remove encroachments.
2. Weeds and dogs need to be removed from the PA regularly.
3. The number of awareness programmes that are conducted needs to be increased.
4. Appropriate signage is to be placed at vantage points for interpretation and warnings.
5. Tourists should not be allowed to proceed on foot beyond a certain point, and they should not be allowed to get down from their vehicles.
6. Hawkers may be allowed only near the gate or entry point and not deep inside the park.
7. Battery-operated vehicles are to be introduced at the earliest for the benefit of tourists.
8. Private vehicles must be parked at designated places and must not allowed inside the park.
9. A curriculum and special training modules on various aspects of wildlife management may be developed. Training needs to be imparted at the nearest Forest Training Institute.
10. The wildlife healthcare centre needs to be established in a new separate building having modern equipment.
11. The division office should be made flood-safe.
12. The intelligence gathering system should be strengthened, and the secret service fund is to be utilized.
13. Considering the shortage of and need for forest *chowkies*, Bhoot Bungalow, situated at a vantage point, may be modified and converted into a protection hut or forest *chowky*. Modifications and alterations should be minimal, keeping in view the fact that it merges with the environment.
14. The use of land should be minimized even in the administrative zones. Buildings should be concentrated near the habitations only in a cluster, without disturbing much land.
15. A large amount of fuelwood has been stacked in almost all the staff quarters. This tendency should be stopped, the use of fuelwood should be discouraged, and those residing inside the PA must be provided with LPG connections to reduce the pressure on the forest.
16. A small canteen must be established at a suitable place in the administrative zone for providing basic requirements such as drinking water, tea, food, etc., and it should be run through a VEDC or SHG.
17. The souvenir shop can also be run by VEDC members and not by the staff of the park.
18. Area-specific and need-based research projects need to be identified, prioritized and taken up annually. The findings of the research may be utilized for management and for enhancing the PA values. An annual research seminar may be organized.

Evaluators
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

24. Thane Creek Flamingo Sanctuary, Maharashtra
MEE Score- 75.92% (Very Good)

Management Strengths

1. The final notification of Thane Creek Flamingo Sanctuary (TCFS) under section 26 of the Wildlife (Protection) Act 1972 has been issued.
2. The strategic location and easy access of the sanctuary can lead to a large tourism influx from Mumbai and the surrounding areas.
3. The sanctuary—Asia's largest creek ecosystem—has a very rich biodiversity. The mangroves act as a huge carbon sink.
4. Flamingos (both the lesser flamingo and the greater flamingo) visit the sanctuary each year in very large numbers (18,000–20,000 greater flamingos and 10,000–12,000 lesser flamingos).
5. The mangrove forests provide ecosystem services to the city of Mumbai, including disaster protection and pollution abatement services.
6. There are many opportunities for provision of livelihoods through eco-tourism and subsistence fisheries.
7. An excellent state-of-the-art interpretation centre is functional, catering to the needs of Mumbai's schools and eco-tourists.
8. An ESZ proposal is ready and has been sent to the government.
9. Freshwater intake is continuous from the Ulhas river.
10. The sanctuary has four or five satellite wetlands around it.
11. The available funds are adequate and are mostly utilized.
12. A draft management plan is ready.

Management Weaknesses

1. The current staff strength is inadequate for the management of TCFS and the eco-sensitive zone.
2. Development projects have been proposed, including the construction of new bridges, roads, sewage treatment facilities and landfills, which may increase the level of human activity and disturb the flamingo habitat.
3. Dumping of solid wastes and debris generated by constant redevelopment works in the urban belt is a threat to the ecosystem.
4. Pollution of the water body and mangroves caused by domestic waste and sewage is an increasing concern. Seepage of industrial and organic wastes, including plastics, will have a deleterious effect on the ecosystem.
5. Electric transmission lines passing through the sanctuary are a potential threat to the flamingos.
6. Eutrophication due to high nutrient levels has not been checked, resulting in algal blooms, which may affect the community of aquatic organisms.
7. Siltation is resulting in a decrease in the inflow of fresh water from the river, and this can lead to intrusion of mangroves into the mudflats and loss of the foraging area available for the waders.

Immediate Actionable Points

1. At least four water stations should be established at vantage or vulnerable points and regular monitoring of the health of the water, including the aquatic flora and fauna, must be taken up at least once every 3 months, and the reports should be analysed.
2. Installation of CCTV and cameras at strategic points is needed to establish a surveillance network.
3. Regular monitoring of the ecosystem should be carried out using at least two drones.
4. The process of gathering intelligence through informers must be strengthened using the funds available for the purpose.
5. A system of regular collection and disposal of trash and plastic must be established.
6. A list of traditional fishermen may be prepared. No new fishing licences should be issued in the future.
7. Eco-tourism needs to be promoted as a means of livelihood generation for the fishing community.
8. The removal of encroachments must be given the highest priority.
9. Bird diverters may be installed along the electricity lines passing through the sanctuary.
10. The mudflats are to be kept free of mangrove vegetation so that the waders can forage effectively.
11. The boundary demarcation work must be completed at the earliest.
12. Census of the flamingos should be carried out annually in collaboration with the BNHS and volunteers.
13. Railings need to be put up on both sides of the jetty. Some signage is also needed.
14. The boats of the local fishermen may be utilized for tourism.
15. The skeleton of the blue whale, displayed in the open, needs to be kept within a glass enclosure so that the vagaries of weather will not cause it to deteriorate.

Evaluators
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

25. Tipeshwar Wildlife Sanctuary, Maharashtra
MEE Score- 70.80% (Good)

Management Strengths

1. This is a compact sanctuary, having an area of 148.63 km^2. It is well connected. Its final notification was issued in 1997.
2. The entire boundary has been demarcated with boundary pillars.
3. Only one village, Pitapungri, is located inside the sanctuary. Two other villages, Tipeshwar and Maregaon, were relocated in 2012 and 2014, respectively.
4. The eco-sensitive zone was notified on 18 September 2018.
5. The sanctuary has an approved management plan.
6. The strength of the staff is adequate: four Foresters, one Range Forest Officer and 23 Forest Guards for 14 beats. All the posts are filled up.
7. The sanctuary receives adequate funds for most of the tasks, and they are released in a timely manner.
8. There is a very good habitat, adequate water and a prey base for tigers.
9. There is very good potential for tourism in the sanctuary.

10. There are 10 protection camps with a wireless network, and there are two entry gates with check posts.
11. The number of vehicles is adequate. There are two vehicles for the RFO and one each for the DFO and ACF.
12. The sanctuary is easily reachable. It is located 165 km from Nagpur on NH 44.
13. Twenty fire blowers and one grass cutter are available for firefighting. This firefighting equipment is adequate. One patrol vehicle with all this equipment is ready at all times to be deployed for fire control.
14. Tigers are commonly sighted. The tiger is the flagship species of the sanctuary.
15. The tiger population of the sanctuary is connected with Tadoba and Kawal and so forms part of a larger tiger conservation landscape.
16. There are 29 fully functional eco-development committees (EDCs).

Management Weaknesses

1. The sanctuary is surrounded by 26 villages, and one village (Pitapungri) lies within the sanctuary boundary.
2. There is heavy cattle grazing on the periphery, but the cattle do not enter deep inside the sanctuary.
3. Some grazing is happening inside the village within the sanctuary, Pitapungri.
4. Illicit felling of trees such as teak and sandalwood is taking place in the sanctuary.
5. The forest is fire-prone in summer, and the terrain, especially in Arli Range, is undulating and difficult to access.
6. There is only one range for the entire sanctuary, and therefore it is unwieldy to manage.
7. The threat of poaching exists. Three tigers have been accidentally snared (in traps set for chital). Two of these tigers were killed after 2012.
8. The functioning is greatly hampered by the lack of availability of ministerial staff in the range office
9. The interpretation centre is not functional; only the building exists.

Immediate Actionable Points

1. The staff strength should be evaluated and reconsidered during the mid-term review of the management plan. Presently, 81 posts have been asked for. Pages 119 and 211 of the management plan should be reconciled.
2. One more range may be created for administrative convenience, as presently the entire sanctuary consists of only one range.
3. Since this sanctuary has a source population for tigers, efforts must be made to declare Tipeshwar a tiger reserve and protect the tigers and the habitat better.
4. Signage needs to be put up at the entrance gate and at the tourist facilities.
5. Tourist guide training programmes have to be started so as to upgrade the skill levels of the guides.
6. Brochures need to be made, giving information about the sanctuary management in English, Hindi and Marathi.
7. Zonation plans need to be prepared for all the zones.
8. WII may be consulted for technical expertise in creating a state-of-the-art interpretation centre.
9. A cut-and-carry system for fodder may be implemented in selected areas as a management prescription, after a suitable review of the management plan for a limited period to reduce the hazard of fires and to improve the habitat quality and the relationship with the community.

10. The informer system, with secret funds for informers, may be activated. The intelligence gathering system should be strengthened.
11. Monitoring activities and research studies may be outsourced.
12. The management plan must have a chapter on climate change and separate chapters on new works/creation of assets and on the maintenance schedule.

Evaluators
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

26. Tungareshwar Wildlife Sanctuary, Maharashtra
MEE Score- 64% (Good)

Management Strengths

1. Tungareshwar Wildlife Sanctuary is a compact area, 25 km from SGNP, easily approachable from the Mumbai–Ahmedabad Express Highway.
2. There is no habitation inside the wildlife sanctuary.
3. The forest has a high canopy cover, with the density varying from about 0.6 to 0.9.
4. There are 12 perennial water springs inside the sanctuary, which provide plenty of water to sustain the vegetation and wildlife.
5. Tungareshwar has an approved management plan, expiring in 2028, and has been made according to the guidelines of WII.
6. The staff available is adequate for management and protection.
7. The budget available for various activities is adequate, and the funds are released timely except for CSS.
8. The sanctuary is connected well with the broader landscape through Sanjay Gandhi National Park, Tansa Wildlife Sanctuary, Malshej Ghat Wildlife Sanctuary and Harishchandragad Wildlife Sanctuary.
9. A plan for firefighting is prepared each year and implemented well on the ground. The number of fire lines is adequate, and the fire lines are maintained each year.
10. Communication with the staff inside the sanctuary is carried out through the mobile network.
11. The boundary of the sanctuary has been demarcated by installing boundary pillars.
12. A draft ESZ has been prepared, and the process of declaration of the ESZ is under way.
13. While there are 20 villages around the periphery, there is no habitation inside the sanctuary, and there is no problem of cattle grazing inside the WLS.
14. The dependence of the villagers on fuelwood in the periphery is very low.
15. There are three nature trails, and these are being used by tourists.

Management Weaknesses

1. The park has a porous boundary.
2. No EDC has been constituted because the area is not under a gram panchayat.
3. An ashram of Balyogi Sadanand and the Tungareshwar temple located inside the PA, are causes of a lot of human interference.
4. Devotees visiting the Tungareshwar temple and the ashram, generate huge amounts of and associated nuisance.
5. The infrastructure is inadequate for the staff as well as for tourism.

6. The Kaman–Bhiwandi State Highway and the Western Express Highway run along the boundaries of the sanctuary. As a result, there is wildlife mortality—11 leopards have been killed in 6 years.
7. Claims and disputes under the FRA have not been settled. Tribals have been resettled, but non-tribals have not yet been resettled.
8. Ploughing back the revenue from the entry tickets into the development/protection works of the PA is not allowed.
9. The notification of the eco-sensitive zone of the PA has not been issued yet.

Immediate Actionable Points

1. Restoration of the corridors connecting the PA with the larger landscape needs to be taken up with the government on priority.
2. Meadow development needs to be done to increase the availability of forage for wild ungulates.
3. Steps need to be taken to reduce the wildlife mortality due to accidents along the corridors.
4. The process of notification of the eco-sensitive zone of the PA needs to be expedited.
5. The FRA settlements for the non-tribals need to be expedited at the Collector or Corporation level.
6. Fencing needs to be done at vulnerable points, especially along the Western Express Highway. A pukka boundary wall is recommended.
7. The interpretation center needs to be redeveloped and made functional on the lines of the one at Thane Creek Wildlife Sanctuary.
8. The entire sanctuary, with an extent of 85 km^2, is administered under just one range. One more forest range needs to be created for better management so that there are two ranges, the East and West ranges.
9. Additional staff members, 18 Forest Guards and some temporary staff members, are needed for patrolling the area and for tourism activities.
10. The proposals for ploughing back the revenue from the entry tickets need to be followed up at the government level.

Evaluators

Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

27. Yawal Wildlife Sanctuary, Maharashtra
MEE Score- 65.80% (Good)

Management Strengths

1. The sanctuary ispart of the Satpuda Tiger Landscape, with tropical dry deciduous forests. The tiger corridor runs from Melghat Tiger Reserve, in the east, to Anerdam Wildlife Sanctuary and Shoolpaneshwar Wildlife Sanctuary, to the west.
2. The tiger is the flagship species. The other species include the leopard, sloth bear, chinkara, four-horned antelope and blue bull.
3. The predominant plant species are *anjan* (*Hardwickia binata*), *salar* (*Boswellia serrata*) and *dhawda* (*Anogeissus latifolia*).
4. The sanctuary has an approved management plan, for the period from 2013–14 to 2022–23.
5. The Zoological Survey of India has documented more than 200 spider species in the sanctuary, and it is one of the hotspots in the dry tropical deciduous habitat.

6. The sanctuary has a very rich avifauna. A total of 114 bird species have been recorded. Yawal has the potential to qualify as a Secondary Bird Area of BirdLife International. Many bird species endemic to the Western Ghats are found here (e.g., Vigors's sunbird, Malabar whistling thrush and lesser yellownape).
7. The area is the point of origin of three local rivers, viz. the Aner, Suki and Manjal, and serves as the catchment for these major rivers.
8. The ecotourism potential of the sanctuary is tremendous.
9. Encroachments with a total extent of 1200 ha were removed from the sanctuary in 2012.
10. Six lady Forest Guards are posted in the sanctuary.
11. The sanctuary has an efficient firefighting management system. A fire line of total length around 300 km (and width 6 m) has been created as a firefighting measure. There are 10 firefighting squads, with all necessary equipment, that operate in allotted areas.
12. Twenty water holes have been created in the sanctuary, and there is assured availability of water during summer.
13. Villagers support Yawal Wildlife Sanctuary because they realize that its existence improves their lives through the implementation of the Shyama Prasad Mukherjee and Jan Vikas schemes.
14. Green Army Maharashtra has about 2500 volunteers and provide support to the management of the sanctuary.
15. Members of Eco-Club visit the sanctuary frequently and provide support.
16. The staff strength is adequate, but the vacant posts need to be filled up at the earliest.

Management Weaknesses

1. Five villages are located inside the sanctuary, and 10 villages are located outside it. As a result, there is heavy biotic pressure in the form of livestock grazing, illicit cutting, encroachment and fires.
2. Water is a limiting factor.
3. Most of the staff members are not trained and have little orientation towards wildlife management.
4. The sanctuary has a porous boundary, with no boundary pillars.
5. There is not much support from NGOs.
6. No nature interpretation centre has been established.

Immediate Actionable Points

1. The final notification of the sanctuary needs to be issued at the earliest, as this has been pending since 2014.
2. Efforts need to be made to settle claims of forest rights under the FRA speedily so that encroachments can be removed.
3. Relevant training in wildlife-related issues may be imparted to the untrained staff under the capacity building programme. One of the RFOs may be sent to the Wildlife Institute of India for the Certificate Course in Wildlife Management.
4. Ecological and socio-economic surveys need to be carried out for getting baseline data.
5. Vacant posts need to be filled up at the earliest.
6. Boundary demarcation work is to be taken up on top priority.
7. An eco-tourism plan may be prepared so as to to fully utilise the eco-tourism potential of the place.
8. Two firefighting vehicles, one for each range, and six more grass cutters need to be procured to carry out firefighting operations in an efficient manner.
9. Two open Gypsies should be procured for tourism purposes. Local people must be encouraged to provide tourism facilities or home-stays for tourists.

10. A nature interpretation centre should be made functional at the earliest. The staff should visit Thane Creek Sanctuary for establishing state-of-the-art gadgets.
11. The abundance of weeds in the sanctuary must be evaluated regularly and a plan drawn up for eradicating them.
12. The plastic sheets used at the bottom of the water holes must be removed as they are very harmful if they are eaten by wild animals.
13. An adequate number of speed breakers as well as proper signage about the speed limit needs to be put up at the appropriate places on the 20 km stretch of the state highway passing through the sanctuary.
14. The support of the Wildlife Institute of India may be enlisted for systematic monitoring of populations of key species.
15. The research priorities for effective management of the sanctuary must be decided. University students/researchers or NGOs such as BNHS and WWF may be invited to assess the people's dependence on the natural resources and to undertake other research work.
16. An independent website may be created for the sanctuary.
17. The brochures should have management-related information.
18. EDC members may be trained as eco-guides.
19. The intelligence gathering system should be strengthened, and the secret service funds must be utilised.
20. A feedback register should be placed at the entry gate once tourism starts.
21. Additional field equipment such as binoculars, GPS, camera traps, SLR cameras with tele lenses and drones must be procured for monitoring purposes.
22. A chapter on climate change may be included in the management plan during the mid-term review.
23. A map showing the connectivity of the PA with the adjacent forest areas may be prepared, and implementation of the landscape-level conservation/ecosystem approach may be attempted.
24. A proposal to have the PA declared a tiger reserve may be sent to the concerned authorities.
25. A number of mini core areas must be identified and marked on the map as well as on the ground.

Evaluators
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

28. Yedshi Ramling Ghat Sanctuary, Maharashtra
MEE Score- 72.41% (Good)

Management Strengths
1. Yedshi Ramling Wildlife Sanctuary was declared in 1997, and it has an approved management plan for the period from 2015–16 to 2024–25.
2. The total area of the sanctuary is 22.37 km^2. It has an adequate staff strength (one RFO, three Forest Guards, three work charge).
3. It is located on NH 211, and it is easily approachable.
4. Almost the entire length of the boundary (41 km) is well demarcated with a stone wall and old boundary pillars.
5. The flagship species is the blackbuck.

6. There is one natural perennial water body inside the sanctuary.
7. No rights and concessions are pending, and there are no villages located inside the sanctuary.
8. Every part of the sanctuary is approachable through all-weather roads for patrolling. One vehicle (Tata Xenon) is dedicated to patrolling.
9. The sanctuary is well known because of the presence of the Ramling temple, which attracts many visitors, and "Gurukul". The sanctuary gets around 2 lakh visitors annually. Gurukul accommodates 78 students and runs nature awareness programs.
10. There is a Heritage Railway Bungalow that is used as a guest house by the railway department. It has an old train station, popularly known as "Ramling".
11. The sanctuary has adequate field equipment, such as binoculars (two pairs), GPS (two), camera traps, cameras with normal lenses and Android phones. There are fire blowers (two), fire beaters (15) and one grass cutter for fire management.
12. An eco-sensitive zone has been notified.
13. Eight bore wells are used to fill water holes to meet the water scarcity during summer.
14. There are eight nature trails, of length 1–3 km, and four watch towers for used by tourists and the staff.
15. The sanctuary faces very low threats, and there is almost no human–wildlife conflict.

Management Weaknesses

1. Three villages are located at the periphery (100 m to 3.5 km) of the sanctuary, and the 2000–3000 cattle of these villages depend on resources of the sanctuary.
2. The sanctuary is drought- and fire-prone because of its location.
3. The sanctuary does not have any staff member trained in wildlife management.
4. The Latur–Barshi state highway passes through the sanctuary, and the Ramling temple is situated in the sanctuary. The increasing vehicular traffic and the large numbers of devotees visiting the temple in summer cause excessive disturbance to the wild animals.
5. No zonation plan has been prepared for the PA.
6. Only one EDC has been established so far though there are three villages.
7. Weeds (*Lantana* and *Parthenium spp*) are present in large chunks of the sanctuary and are spreading.
8. The nature interpretation centre is not functional.

Immediate Actionable Points

1. Zonation plans need to be prepared for each zone as per the management plan.
2. A nature interpretation centre needs to be established and made functional using modern gadgets. The DFO and RFO may visit the Thane Creek Nature Interpretation Centre to get an idea of a modern nature interpretation centre.
3. The staff need to be sent to WII and state training institutes to get specialized training in wildlife management-related issues.
4. Twenty more camera traps may be procured for effective monitoring.
5. The railway guest house needs to be brought under the control of the forest department for administrative reasons because it is not required by the railways any more.
6. Appropriate signages, speed breakers and entry and exit gates are needed, particularly for the highway section of the sanctuary.
7. The feasibility of creating an elevated road for the portion where highway passes through the sanctuary must be explored. An elevated road may be built if it is found feasible.
8. The availability of water for the wild animals may be enhanced during summer by creating more water holes.

9. EDC members should be trained in housekeeping, and they may run the forest guest house.
10. The participation of the public in the management of the sanctuary must be initiated, and two more EDCs need to be established and made functional. A micro-planning exercise must be conducted for these villages.
11. Signage may be put up at the temple to prevent people from feeding monkeys. A public awareness programme must be organized through NGOs during the pilgrimage season.
12. Any further expansion of the temple complex must be prevented, and the existing boundary may be marked with pillars.
13. The proper methodology for monitoring the flagship species must be identified, and the Wildlife Institute of India may be requested to organize a population monitoring workshop.
14. Area-specific and need-based research studies may be taken up for the PA, and the findings may be utilized in the management of the PA.
15. Weeds such as *Lantana* and *Parthenium* should be removed at regular intervals.
16. Two checkpoints are recommended. One is being constructed this year.
17. A dedicated website needs to be created for the sanctuary. Tickets bearing forms for obtaining feedback from visitors must be introduced.
18. More publicity material, in different languages, may be prepared, and it may be disseminated to the public at various tourist places.
19. Delineation of multiple mini core areas is to be explored, and the core areas may be kept free of disturbance.
20. Chapters on the mid-term review and on climate change may be included in the management plan. Mid-term reviews should be planned for the third and seventh years.
21. The task of mapping the natural resources of the sanctuary through GIS may be outsourced.
22. Some basic books on mammals and birds of India may be given to each Forest Guard.
23. The abandoned houses just adjacent to the sanctuary may be utilized for eco-tourism activities.
24. The information regarding the compensation paid for human–wildlife conflicts may be obtained from the territorial division.
25. Efforts must be made to declare the "Railway Site" a natural heritage site.
26. Some business houses may be tapped to secure CSR funds for the development of the sanctuary.

Evaluators
Shri U.M. Sahai, Former CWLW, Government of Rajasthan
Dr. Advait Edgoankar, Scientist, Indian Institute of Forest Management, Bhopal
Ms. Seema Bhatt, Independent Scientist, New Delhi
Dr. S.P. Goyal, Subject Matter Specialist, WII

RAJASTHAN

The MEE scores of the 7 PAs entrusted to our team for evaluation varies from 73% to 30%. They do reflect the varying degree of success in wildlife management of the state. Apart from the general paucity of funds, huge shortage of front-line staff due to the prevailing ban on new recruitments is a major issue in all PAs which adversely affects the protection and management activities.

Other issues pertaining to each PA can summarized as below.

1. Though very well managed Keoladeo National Park needs to apply more attention to tackle the increasing alkalinity of its water body and also to the management and protection of the satellite water bodies which the migratory birds use for feeding and roosting.

2. Ramsagar WLS is the one of the worst managed PA the Team has visited in the state. The first step that need to be taken is to post at least an ACF level officer at Dholpur to look after all the three sanctuaries close by, namely Van Vihar, Ram Sagar and Kesarbagh. Also, a regular range officer should be posted with adequate staff and infrastructure to assist the ACF in his task.

3. As regards Sajjangarh WLS sanctuary the feasibility for expanding its size by adding the forests of Udaipur division which are contiguous to the PA needs to be explored. The proposal formulated by the Warden to form a masheer conservation reserve in Badi lake which will enhance the conservation value of the Park can be considered favourably.

4. Shergarh WLS has a unique advantage by having a dedicated fund of Rs 121.8 cores deposited with RPACS. The most immediate should task should be to institutionalise the flow of funds to the park from this corpus so as to take up long neglected conservation and protection activities.

5. The success of Tal Chapper WLS has brought in its own share of new issues. Hence to sustain its success in years to come the pending proposals to expand the area, to close vehicular traffic through the state high way inside the PA, special measures to protect the habitat of Spiny-tailed lizard etc need to be pursued with vigour.

6. 495 sq.km area is huge in size and hence Todgarh Raoli WLS requires the services of a dedicated Wild Life Warden to manage its affairs more effectively.

7. The story of Van Vihar WLS, due to mainly socio-economic reasons, is that of a failed attempt in show casing the past glory of wildlife management in Rajasthan. Along with Ram Sagar WLS this PA also has to be brought under a wild warden stationed at Dholpur for better management.

29. Keoladeo National Park, Rajasthan
MEE Score- 72.50% (Good)

Management Strengths

1. *The diversity of bird population and the easewith they can be watched by visitors.*The diversity of bird spotted in the area, about 375 species, is definitely the major strength of the park. Moreover, unlike many other PAs, the visitors can move around the park with minimum disturbance to the birds and watch them for long periods.

2. *International recognition.*The national park is a Ramsar site recognised under the Convention on Wetlands of International Importance. Similarly, UNESCO has recognised it as a World Heritage Site of natural importance. Such recognition compels the PA management and the government to maintain higher standards in protecting the ecosystems of the area.

3. *Close involvement of NGOs and* research *organisations.*The PA management has always maintained close liaison with various NGOs, research institutes and scholars in studying and understanding various ecological issues related to the management of the park. This has helped in the initiation of timely interventions in tackling the issues.

4. *Robust contribution to the local economy.*On an averageabout 1.4 lakh tourists visit the park in a year. A large number of local villagers are employed in serving these visitors as rickshaw operators, guides, etc. Similarly, many locals are employed in related sectors such as hotels, transport and trade. So there is a mutual bond between the PA management and other stakeholders, which helps sustainable management of the park.

Management Weaknesses

1. *Scarcity of water.* The park needs more than 550 mcft of water each year to sustain its ecosystems. Though different sources are tapped for the purpose, there is no guaranteed source yet to supply the required quantum of water. As the frequency of drought years has been increasing over the recent years, this is a matter of grave concern.

2. *Threat from invasive species.*Though consistent efforts are being made to control the invasive plant species *Prosopis juliflora* and the fish species African sharptooth catfish, they both remain a threat to the ecosystems of the park.

Immediate Actionable Points

1. *Protection and management of satellite water bodies:* Keoladeo National Park does not exist in isolation. Large number of birds move between many water bodies nearby, both within Rajasthan and outside. Many of these are privately owned. A comprehensive study needs to be commissioned to understand the dynamics that exists between these water bodies and Keoladeo. If necessary, management interventions, in association with the local community, need to be initiated to protect the most critical among them.

2. *Measures to upgrade the visitor management facilities.*The flow of tourists to the park is bound to increase in coming years. A well-thought out plan to enhance the visitor facilities and to manage this increased flow needs to be formulated now itself.
3. *Measures to tackle the increasing alkalinity in the water body.*Studies have indicated a slow shift in the pH value of the water in the park towards alkalinity. This needs to be watched closely.

4. *Take immediate measures to fill up the vacancies of the front line staff.* In all the PAs that we have visited, the delay in filling up the retirement vacancies among the protective staff and the Range Officers has been pointed out as one of the most urgent issues. Hence the CWLW of Rajasthan needs to bring the matter to the attention of the concerned decision makers without any further delay.

<u>Evaluators</u>
Shri V. Gopinath, IFS, Former HoFF & CWLW, Govt. of Kerala
Shri Roy P. Thomas, Former JD (Wildlife), MoEFCC
Dr. Manisha Thapliyal, Scientist-F, Forest Research Institute, Dehradun
Dr. Manoj Nair, IFS, Scientist on Deputation to WII

30. Ramsagar Wildlife Sanctuary, Rajasthan
MEE Score- 29.31% (Poor)

Management Strengths

To put it mildly, the MEE team could not observe either any management strengths or any unique features worth mentioning in the report.

Management Weaknesses

1. *The absence of a well thought out management plan for the PA is a major drawback*. The MEE team was given to understand that the first management plan of the sanctuary was drawn up only in 2014 and that its currency expired in 2018. This plan was never accorded formal approval for reasons not known to anyone, even. So for almost 60 years of its existence, the sanctuary has never had an approved plan to protect its wildlife and forests.

2. Poor and hostile socio-economic conditions prevailing in the 43 villages within a 5 km distance around the area are major factors imperiling the development of the sanctuary. PAs such as this one cannot develop in isolation. Rather, their development can only be in tandem with the overall economic development of the area.

3. Frequent juggling of the administrative set-up is another management weakness that has adversely constrained the management of the sanctuary.

4. Acute shortages of staff members and other resources have also contributed to the sorry state of the PA.

Immediate Actionable Points

1. The first step to be taken is to strengthen the field administration of all the three sanctuaries close by, namely Van Vihar, Ram Sagar and Kesarbagh. At least an ACF-level officer should be posted at Dholpur to look after the day-to-day affairs of these PAs. Also, a regular range officer should be posted with adequate staff and infrastructure so as to bring back the past glory of all these potential wildlife areas.

2. Steps need to be taken immediately to prepare a well-thought out management plan for this wildlife sanctuary.

3. In all the PAs that we have visited, the delay in filling up the retirement vacancies among the protective staff and Range Officers has been pointed out as one of the most urgent issues. Hence the CWLW of Rajasthan needs to relentlessly pursue the matter till all the new recruits are in position.

<u>Evaluators</u>
Shri V. Gopinath, IFS, Former HoFF & CWLW, Govt. of Kerala
Shri Roy P. Thomas, Former JD (Wildlife), MoEFCC
Dr. Manisha Thapliyal, Scientist-F, Forest Research Institute, Dehradun
Dr. Manoj Nair, IFS, Scientist on Deputation to WII

31. Sajjangarh Wildlife Sanctuary, Rajasthan
MEE Score- 67.24% (Good)

Management Strengths

1. *Location and size.* The PA is located in the Aravalli hill ranges and is only 5 km from Udaipur city. Its location adds to its ecological importance and its role as an undisturbed catchment of the lakes that supply water to the city. Since it is close to Udaipur, it is easily accessible. It is an excellent centre for showcasing the rich biodiversity of the Aravalli hills and for disseminating the message of nature conservation to the general public. Since the extent of the sanctuary is only 5.19 km^2, protecting it and managing it are rather easy for the personnel in charge.

2. *Employment opportunities for the villagers in the city.* There are eight villages located within 5 km of the boundary of the PA. In normal circumstances, these villages would be exerting excessive pressure on the PA for meeting their livelihood and sustenance needs. However, being close to a vibrant city, many of the men and women of the villages find employment in different sectors in the city, which eases pressure on the PA.

Management Weaknesses

1. *Presence of an attractive tourist destination inside the PA.* Approximately 4 lakh tourists visit the PA each year. Most of them visit the place to witness the enchanting sight of the sunset or sunrise. In other words, they are not primarily wildlife tourists. The hustle and bustle inside the PA are not ideal for a nature protection. Moreover, most of the energy and time of the PA management are taken up by the works related to visitor management.

2. *Limited scope for integrating the PA area into a larger landscape.*With the sanctuary being located close to a big city and the forests nearby being fragmented, the scope of integrating the PA into a larger natural ecosystem is limited.

Immediate Actionable Points

1. *Preparation of a zonal master plan for the ESZ.* The Government of India notified an area of extent 28.7 km^2 around the PA as an Eco-Sensitive Zone on 13 February 2017. A zonal master plan needs to be prepared and approved to derive the full benefits of this notification. The park management may take thenecessary steps in this regard.

2. *Steps to increase the size of the PA.* The possibilities of increasing the size of the PA by adding the forest blocks of the Udaipur territorial forest divisions that are contiguous to the PA may be explored.

3. *Measures to strengthen the eco-tourism initiatives.* There is considerable scope to involve the local population in all the tourism-related activities in general and in transporting visitors to and from entry gate of the Sajjangarh palace in particular. This can be done by the EDC by procuring vehicles and operating them on its own. Such models are successfully working in many parts of the country. These may be studied and implemented after suitable modification to suit the local needs. Such an initiative will open up a large number of employment opportunities for the members of the EDC.

4. *Declaration of Masheer conservation reserve.* The Wildlife Warden has mooted a proposal to declare the adjoining Badi lake a Masheer conservation reserve. This move will strengthen the ecological integrity of the PA, and it may be expedited.

5. *Approval of the management plan.* Though the current 10-year management plan is for the period up to 2022–23, it is yet to be approved by the Chief Wildlife Warden. The process of approval of the management plan needs to be expedited.

Evaluators
Shri V. Gopinath, IFS, Former HoFF & CWLW, Govt. of Kerala
Shri Roy P. Thomas, Former JD (Wildlife), MoEFCC
Dr. Manisha Thapliyal, Scientist-F, Forest Research Institute, Dehradun
Dr. Manoj Nair, IFS, Scientist on Deputation to WII

32. Shergarh Wildlife Sanctuary, Rajasthan
MEE Score- 39.17% (Poor)

Management Strengths

1. The availability of a dedicated pool of Rs.121.80 crores for the development of the sanctuary is a unique advantage of the PA. Even without drawing any amount from the corpus, around Rs.10 crores can easily be made available to the PA from the interest. An infusion fund of this kind will help tackle most of the festering threats and issues faced by the sanctuary.

2. The fact that this sanctuary was part of a mega Tiger habitat that can still be restored makes the outlook tantalisingly brilliant.

Management Weaknesses

1. There is a lack of administrative will to nurture the sanctuary back to its glorious past. This is a serious drawback. It is disappointing to note that it took almost three decades to formulate a management plan for the PA and to bring its administration under a departmental structure dedicated to wildlife management.

2. The financial and manpower resources at the disposal of the PA management are grossly inadequate. As a result, it is hard to show any meaningful impact of the various interventions that are presently made to improve the conditions of the sanctuary.

Immediate Actionable Points

1. The most immediate and easy task is to institutionalise the flow of funds to the park from the dedicated amount deposited with RPACS. A clear-cut plan of action for utilising the amount without depleting the corpus amount should be formulated.

2. About 39% of the sanctioned posts of the PA are lying vacant. As with other PAs of the state, this is a serious bottleneck that warrants urgent action.

3. There are two enclosures under private ownership inside the PA and are sources of perpetual threats to the integrity of the sanctuary. These relatively small areas may be either acquired or resettled to improve the status of the PA.

Evaluators
Shri V. Gopinath, IFS, Former HoFF & CWLW, Govt. of Kerala
Shri Roy P. Thomas, Former JD (Wildlife), MoEFCC
Dr. Manisha Thapliyal, Scientist-F, Forest Research Institute, Dehradun
Dr. Manoj Nair, IFS, Scientist on Deputation to WII

33. Tal Chhapar Wildlife Sanctuary, Rajasthan
MEE Score- 67.24% (Good)

Management Strengths

1. *Bird diversity.* More than 330 species of bird have been spotted in the PA. These include the imperial eagle, tawny eagle, short-toed eagle, brown dove and demoiselle crane, as well as skylarks, bee-eaters and vultures. The major attraction of the sanctuary is the ease of accessibility to all parts of the PA and the chance to spot and observe birds for long durations without any disturbance.

2. *Thriving blackbuck population.* The Blackbuck is included in Appendix III of CITES. Its population in Tal Chhapar has exploded from 800 in 2007 to nearly 3000 in 2018. This is a great success story and offers a lesson to other PA managers about how a committed frontline staff with adequate support from superior officers can do wonders even in a hostile ecosystem.

3. *Great potential for eco-tourism.* The eco-tourism potential of the PA is immense. Apart from the unique attractions in the field, the PA is easily accessible from Delhi, Bikaner and Jaipur. With suitable marketing, responsible eco-tourism initiatives can be strengthened to generate more employment opportunities for the local villagers.

Management Weaknesses

1. *Weak marketing of eco-tourism potential.* In spite of its locational advantages, more-than-average tourist facilities and very satisfying visitor experience, the average number of tourist/visitors is less than 10,000 per annum. The potential to attract more international ornithologists and wildlife enthusiasts to the area is vast. The right marketing efforts need to be made. This will also generate more employment opportunities for the local people.

2. *Person-centric success.* The success story of Tal Chhapar was scripted by a committed officer who retired recently as the Assistant Conservator of Forests in charge of the PA and by his staff. Unless the forest department institutionalises the management strategy adopted during the last decade by posting suitable successors, carrying forward the success may face serious challenges.

Immediate Actionable Points

1. *Immediate decision on expanding the area of the PA.* A few proposals are already pending with the government to add new areas to the PA. The first one is to acquire the adjacent private lands including that of the *goshala*. With this the total area will become about 125 ha. Another proposal is to cancel all the active salt mining leases nearby and add all the mining land, including the abandoned mining lands, to the PA. The total area of the land available thus is about 500 ha. Since salt is not included in the list of essential minerals, it should not be much of a problem to take a decision favourable to the PA. The CWLW, Rajasthan should pursue these two proposals and take a decision without any further delay.
2. *Post a committed Range Officer.* The incumbent in charge of the PA is to retire shortly. So to carry forward the good work done by him and his predecessors the department should ensure that an enthusiastic and knowledgable officer with interest in wild animals and birds is posted to manage the PA.

3. *Decision on translocation of excess Blackbucks.* The Blackbuck population inside the park may spill out at any time, creating human–animal conflicts involving the villagers of the area. So a decision has to be taken about the place, numbers and modality of translocation without any further delay.
4. *Protect the habitat of the Spiny-tailed Lizard.* In their enthusiasm to feed the larger wild animals, some of the ideal habitats of the spiny-tailed lizard have been damaged. As a result, the lizard colony has now shifted to the nearby *goshala* compound. In future interventions, this aspect has to be given due consideration, and the burrows of the lizards have to be given adequate protection.
5. *Close vehicular traffic through the state highway inside the PA.* A length of about 2.7 km of the Tal Chhapar– Sujangarh state highway is passing through the sanctuary, isolating a small portion in the north-west. Since an alternate road is available, decision to close the section of the highway passing through the PA has already been taken. Roadkills of wild animals are frequently seen, but the restriction has not been enforced strictly. The issue may be pursued so as to enhance the integrity of the sanctuary
6. *Strengthen eco-tourism activities.* The present arrival of fewer than 10,000 tourists in a year is far less than the actual potential of the sanctuary. The greater the number of responsible tourists visiting the area, the better it will be for the local economy. So the management of the PA and the Forest Department should take measures to market the attractions of Tal Chhapar in a much more visible manner by engaging professionals.

Evaluators
Shri V. Gopinath, IFS, Former HoFF & CWLW, Govt. of Kerala
Shri Roy P. Thomas, Former JD (Wildlife), MoEFCC
Dr. Manisha Thapliyal, Scientist-F, Forest Research Institute, Dehradun
Dr. Manoj Nair, IFS, Scientist on Deputation to WII

34. Todgarh Raoli Wildlife Sanctuary, Rajasthan
MEE Score- 40.52% (Fair)

Management Strengths

1. The size and location of Todgarh Raoli Wildlife Sanctuary are its major strengths. Spread over 495 km^2, it is located in the middle ranges of the Aravalli Hills, falling in three districts of Rajasthan. About three-fifths of Rajasthan lies in the Great Indian Desert, known as the Thar Desert. The Aravalli mountain ranges, which run from the south-west to the north-east, protect the rest of the state from the advance of the desert. Hence the environmental integrity of the vast area falling within Todgarh Raoli Wildlife Sanctuary is of paramount importance to the state.
2. The location of the PA makes it easily accessible from Udaipur, Ajmer, Pali and Rajsamand. This enhances its eco-tourism potential. If eco-tourism is properly planned, it could provide a means of livelihood to a large number of impoverished families living both within and without the PA.
3. Since the PA is situated in the ecotone between the Thar Desert and the hilly forests of the Aravallis, the diversity of its flora and fauna is unique. The vegetation of the sanctuary falls into the tropical thorn forest, tropical dry deciduous forest, central Indian sub-tropical hill forest and mixed miscellaneous forest types. It has a good population of wild animals, with the panther occupying the apex in the food chain.
4. The average annual rainfall of the area is only 725 mm. The fact that the PA spreads across the catchment areas of eight rivers of the state adds to its importance as a contributor to the water resources of the state.

Management Weaknesses

1. The shape of Todgarh Raoli Wildlife Sanctuary is its biggest drawback. Though it has an extent of 495 km², it is relatively narrow, its width varying from 5 km to 15 km. Its length is about 100 km. The narrow shape of the PA makes it virtually impossible to confine wild animals to it, thereby increasing the chances of human–wildlife conflict. Due to the prevailing cultural reasons and ignorance of the people, the number of complaints and claims for wildlife damage is negligible. But effective management will eventually increase the population of wild animals. So a time will come in the future when a large number of wild animals such as Panthers and deer start to move out of the PA, changing the dimensions of the human–wildlife conflict.
2. The resources available for managing the PA are inadequate, and this is a serious issue. The funds allotted to the sanctuary for protection, eco-restoration works and maintenance of equipment, vehicles and buildings are totally inadequate. The staff strength is only 70, which is far below the minimum required to protect such a large PA. There is also a huge shortfall in the equipment and vehicles needed for protecting and managing the PA.
3. The staff are not properly trained. This is another inadequacy. Apart from the basic training which they underwent when they entered the service, the staff members have no specialised training in wildlife management. This impacts the effectiveness of the management as is evident, for example, from the very poor quality of the wildlife population estimates provided to the MEE team.
4. There are a large number of religious and historical structures spread across the PA. During the festivals, visitors flock to these places, causing pollution and disturbance, thereby harming the integrity of the PA.
5. There are 27 villages inside the PA. Along the periphery there are 114 villages. These widely distributed human settlements, along with their cattle population, are adversely affecting the well-being of the sanctuary. Presently the villagers are not actively involved in the management of the PA. They are considered only as a source of labour for executing departmental works.
6. Todgarh Raoli Wildlife Sanctuary is one of the PAs under the administrative control of the DCF, Rajsamand. Kumbhal Garh Wildlife Sanctuary, which is 610 km² in extent, is also under his charge. Over and above his PA duties, he is also functioning as the DFO of the 129-km² territorial division. The huge size of these areas and the diverse nature of the work may not make for effective administration of Todgarh Raoli Wildlife Sanctuary.
7. No serious attempts have been made to implement the provisions of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act. It will only be prudent to implement the same with all sincerity to garner the support of the population for the efforts of the Forest Department in protecting the PA.

Immediate Actionable Points

1. There is vast potential for eco-tourism in the PA. The opportunities have to be tapped by adopting innovative initiatives involving the local population so as to ensure employment and revenue for them. There are numerous functioning models in many parts of the country that can be adopted after suitable modifications for the local needs. Such measures will ease the pressure on the PA for fodder and other resources.
2. On 12 April 2017, MoEF&CC notified an area of 202.68 km² around the PA as an eco-sensitive zone. The real benefit of this notification will be obtained only after the approval of a master plan for the notified area. Preparing and obtaining approval for a master plan for the ESZ have to be therefore speeded up.
3. The provisions of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act have to be implemented urgently in the PA.
4. Rationalisation of the management should be the top priority for realising the true potential of the PA. Implementation of the foregoing suggestions will need the close

attention, supervision and intervention of the Wildlife Warden. So the feasibility of appointing a Wildlife Warden exclusively for Todgarh Raoli Wildlife Sanctuary deserves to be considered seriously by the authorities

5. There are natural forests in the territorial forest divisions adjoining the PA that are suitable for addition to the sanctuary. A study has to be undertaken to identify all such areas in all the three districts so that the width of the PA can be increased to the maximum extent possible.

Evaluators
Shri V. Gopinath, IFS, Former HoFF & CWLW, Govt. of Kerala
Shri Roy P. Thomas, Former JD (Wildlife), MoEFCC
Dr. Manisha Thapliyal, Scientist-F, Forest Research Institute, Dehradun
Dr. Manoj Nair, IFS, Scientist on Deputation to WII

35. Van Vihar Wildlife Sanctuary, Rajasthan
MEE Score- 32% (Poor)

Management Strengths
The MEE team could not observe any management strengths or any unique features worth mentioning in the report.

Management Weaknesses
1. The absence of a well thought out management plan for the PA is a major drawback. The MEE team was made to understand that the first management plan of the sanctuary was prepared only in 2014. Its currency expired in 2018. The irony is that this plan was neither accorded formal approval nor ordered to be revised. Consequently, even after 60 years of the formation of Van Vihar Wildlife Sanctuary, it does not have an approved management plan.
2. The socio-economic conditions of the 37 villages within 5 km and the hostility of the villagers are major factors imperiling the development of the sanctuary. The PA cannot develop in isolation. Rather the development can only be in tandem with the overall economic development of the area.
3. Frequent juggling of the administrative set-up is another management weakness that has adversely affected the sanctuary.
4. An acute shortage of staff members and other resources has also contributed to the sorry state of the PA.

Immediate Actionable Points
1. The first step required is to strengthen the field administration of all the three sanctuaries close to each other, namely, Van Vihar, Ram Sagar and Kesarbagh. At least an ACF-level officer should be posted at Dholpur to look after the day-to-day management of these PAs. Also, a regular Range Officer should be posted with adequate staff members and infrastructure so as to bring back the past glory of all these potential wildlife areas.
2. Steps need to be taken immediately to prepare a well thought out management plan for the sanctuary.
3. For the first time, a major allocation of nearly Rs.700 lakhs has been made to Van Vihar under CAMPA for constructing an 18-km boundary wall and for improving the infrastructure in the field. The PA management should strive hard to complete the work on time.

4. The management should explore the feasibility of renovating the old rest house under the public–private participation model so as to kindle interest among wildlife enthusiasts to visit the area.
5. The delay in filling up the retirement vacancies among the protective staff and Range Officers has been pointed out as one of the issues that need immediate resolution. Hence the CWLW of Rajasthan needs to pursue the matter relentlessly till the new recruits are in position.

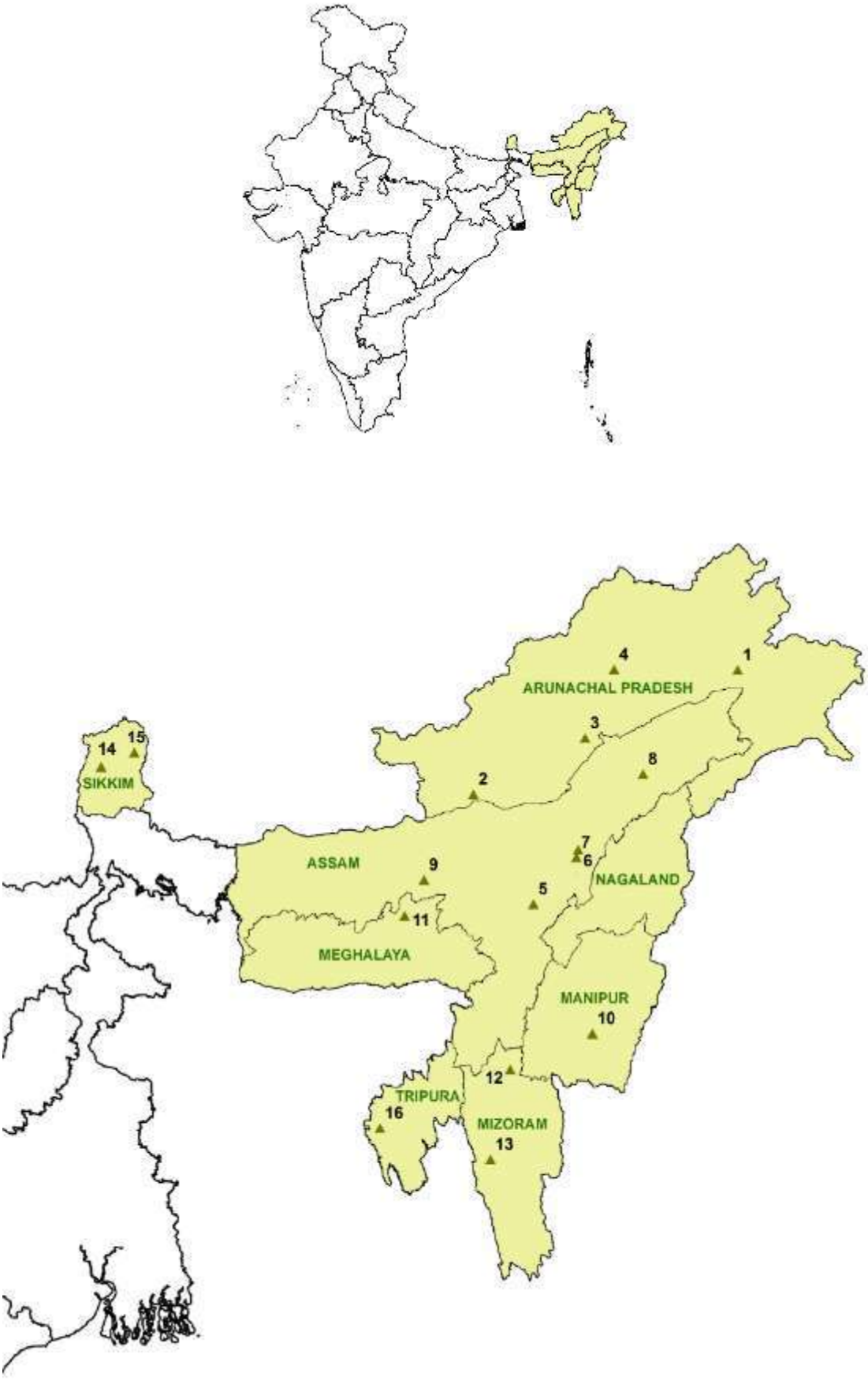
Evaluators

Shri V. Gopinath, IFS, Former HoFF & CWLW, Govt. of Kerala
Shri Roy P. Thomas, Former JD (Wildlife), MoEFCC
Dr. Manisha Thapliyal, Scientist-F, Forest Research Institute, Dehradun
Dr. Manoj Nair, IFS, Scientist on Deputation to WII

NORTH-EASTERN **REGION**

3.5 NORTH-EASTERN REGION

PA ID	Name of NP&WLS	State
1	Mahao WLS	Arunachal Pradesh
2	Sessa Orchid WLS	Arunachal Pradesh
3	Tale WLS	Arunachal Pradesh
4	Yordi Rabe Supse WLS	Arunachal Pradesh
5	Marat Longri WLS	Assam
6	Nambor WLS	Assam
7	Nambor-Doigrung WLS	Assam
8	Pabitora WLS	Assam
9	Pani-Dihing Bird WLS	Assam
10	Keibul-Lamjao NP	Manipur
11	Nongkhyllem WLS	Meghalaya
12	Pualreng WLS	Mizoram
13	Thorangtlang WLS	Mizoram
14	Khangchendzonga NP	Sikkim
15	Shingba Rhododendron WLS	Sikkim
16	Sepahijala WLS	Tripura


ARUNACHAL PRADESH
SIKKIM
ASSAM
NAGALAND
MEGHALAYA
MANIPUR
TRIPURA
MIZORAM
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ARUNACHAL PRADESH

Following are key points of MEE conducted in Mehao WLS, Sessa WLS, Tale WLS and Yorde Rabe Subse Wildlife Sanctuary of Arunachal Pradesh:

1. The infrastructure in all evaluated wildlife sanctuaries is extremely poor which is adversely affecting the management.
2. The management plan has expired in most of evaluated WLS or need some corrections/modifications to deal with management challenges.
3. The Sanctuaries are extremely short of frontline staff to monitor the PA's and ensure integrity especially preventing hunting.
4. There is a lack of trained manpower at all ranks.
5. The research and monitoring activities are poor, and participation of NGO's is very low.
6. The eco-tourism has not attained its objectives. There are no visitor facilities, and updated eco-tourism management plan in all evaluated wildlife sanctuaries.
7. Traditional regular hunting practice by local traditional communities exists.
8. The proposed road network and irrigation and hydropower projects in the area may pose a threat to wildlife sanctuaries hence mitigation measures required.
9. The information available about the key animal species is very poor, and there are almost no monitoring systems in place.

1. Mehao Wildlife Sanctuary, Arunachal Pradesh

MEE Score- 42.50% (Fair)

Management Strengths

1. Mehao Wildlife Sanctuary is situated in the subtropical and alpine zone, resulting in its rich biodiversity. It is known for the Mishmi Takin, Mishmi Titta, Mishmi Wren Babbler, Eastern Hoolock Gibbon, Clouded Leopard, etc.
2. The sanctuary is a part of a greater conservation landscape and is connected to Dibru-Saikhowa National Park and Pova Reserve Forest in Assam, and to D'Ering Wildlife Sanctuary and Dibang Dihang Biosphere Reserve in Arunachal Pradesh.
3. The sanctuary is well connected to the towns nearby, especially with the opening of the Dhola-Sadia bridge (longest bridge in India, constructed on the Lohit river, a tributary of the Brahmaputra). Large number of people visit the Myodia Pass, known for the snowfall it receives. It has a great 'Nature tourism' value.
4. Sanctuary also has a rich heritage related to the Idu Mishmi and Adi tribes, who respect and protect forests.

Management Weaknesses

1. The sanctuary has extremely poor infrastructure, including protection machinery, such as lack of sufficient protection camps and sufficient frontline staff for patrolling and imparting protection.
2. Presence of land dispute with the local communities and gradual encroachment due to lack of proper demarcation of the sanctuary on the ground. An extent of 49 km² of the sanctuary is under orange, cardamom, litchi and kiwi cultivation, home gardens and human habitation.
3. Traditional regular hunting practice by local traditional communities.
4. Fragmentation of canopy especially on southern boundary due to illegal felling and collection of cane and medicinal plants is a serious threat to the Eastern Hoolock Gibbon population and to other arboreal life.

Immediate Actionable Points

1. The dispute regarding the 49 km² extent of the sanctuary should be resolved at the earliest in consultations with the local communities who are highly co-operative in addressing this issue.
2. Immediate demarcation of sanctuary boundaries.
3. The sanctioned strength of the sanctuary needs to be reviewed realistically and must become a part of the Management Plan.
4. Sufficient funds need to be provided for development of infrastructure such as staff quarters and watchtowers, development and maintenance of monitoring trails, habitat management, protection and other activities.
5. Two anti-poaching camps, one each at Eme and Difu, need to constructed on priority.
6. Proper record keeping in terms of updated registers, such as patrolling registers, offence registers, books of visitor details, RTI registers, etc.
7. The capacity of the frontline staff to monitor wildlife should be improved, and they should be provided monitoring equipment. Mid-level officers should send to the WII for training in the wildlife diploma course.
8. An interpretation centre needs to be created. Eco-tourism should be developed with the active participation of the local communities to gradually wean them from traditional hunting practices.
9. As there are no baseline data on key wildlife populations, immediate action should be taken in this regard with the involvement of WII, NGOs, researchers, etc.

Evaluators

Dr. Pradeep Vyas, Former CWLW, Government of West Bengal
Dr. Umesh Kumar Tiwari, Scientist-B, Botanical Survey of India, Arunachal Pradesh
Dr. Bibhuti Lahkar, Scientist-E, AARANYAK, Assam
Dr. Bivash Pandav, Scientist-F, WII

2. Sessa Orchid Wildlife Sanctuary, Arunachal Pradesh

MEE Score- 52.50% (Fair)

Management Strengths

1. Sessa Orchid Wildlife Sanctuary has subtropical and temperate zones, as a result of which it is home to about 200 species of orchid. There is an orchid research centre at Tipi.
2. The sanctuary is part of a greater conservation landscape and is connected to Eagle Nest Wildlife Sanctuary and Doimara Reserve Forest, of Khellong Forest Division, in Arunachal Pradesh. Pakke Tiger Reserve is situated on the eastern bank of the river Kameng.
3. There is very low biotic interference in the sanctuary, and the local communities support the conservation values.

Management Weaknesses

1. The infrastructure in Sessa Orchid Wildlife Sanctuary is extremely poor.
2. The management plan has expired, and a new management plan is yet to be approved.
3. No staff strength has been sanctioned for Sessa Orchid Wildlife Sanctuary. Thus, it is managed by staff members of Khellong Forest Division. Currently only one permanent staff member looks after the sanctuary.
4. There are no visitor facilities, and there is no eco-tourism management at Sessa.
5. The research and monitoring activities are poor, and there is no NGO participation.
6. There is a lack of trained manpower.

Immediate Actionable Points

1. The new management plan should be approved immediately.
2. Sessa Orchid Wildlife Sanctuary should be managed under a new Wildlife Division directly under the Chief Wildlife Warden, Arunachal Pradesh. Adjoining wildlife sanctuaries may be included in the division to make it a workable unit.
3. Proper strength of staff should be sanctioned for Sessa Orchid Wildlife Sanctuary immediately.
4. Sufficient funds should be provided to Sessa for development of infrastructure such as a patrolling vehicle, motor cycles, staff quarters, watch towers, monitoring trails and monitoring equipment.
5. The creation of two new anti-poaching camps should be considered, at Seddel and Nechiphu.
6. The orchid research centre, which is located at Tipi, under Itanagar Silviculture Division, needs to be integrated with the Sessa Orchid Wildlife Sanctuary management for in-situ conservation of orchids and livelihood generation for local communities.
7. Proper documentation (patrolling register, offence register, visitor register, visitor feedback forms, etc.) should be started immediately.
8. The staff capacity should be enhanced by providing them opportunities for training in wildlife management.
9. An interpretation centre needs to be created, and an eco-tourism plan should be developed with the participation of local communities.
10. Researchers from local universities, colleges and NGOs should be encouraged to take up management-oriented research activities at Sessa Orchid Wildlife Sanctuary.

Evaluators

Dr. Pradeep Vyas, Former CWLW, Government of West Bengal
Dr. Umesh Kumar Tiwari, Scientist-B, Botanical Survey of India, Arunachal Pradesh
Dr. Bibhuti Lahkar, Scientist-E, AARANYAK, Assam
Dr. Bivash Pandav, Scientist-F, WII

3. Tale Wildlife Sanctuary, Arunachal Pradesh

MEE Score- 62.50% (Good)

Management Strengths

1. Tale Wildlife Sanctuary has subtropical, temperate and a subalpine zones owing to which it has a rich heritage of floral and faunal diversity.
2. Tale Wildlife Sanctuary is a part of a greater landscape with other forests such as Tale Reserve Forest and Paniyor Reserve Forest.
3. The level of biotic interference in the sanctuary is very low. Hence, all its biodiversity values are sustained.
4. Because its pristine, undisturbed forests are situated in difficult terrain, it is most likely that the sanctuary harbours some unreported plant and animal species.

Management Weaknesses

1. There is no proper protection plan. The management does not encourage forest guards or patrolling personnel to maintain daily duty registers with observations and wildlife sightings. There is no infrastructure for following an effective protection strategy. There are no patrolling paths and camps inside the sanctuary.
2. The sanctuary is short of frontline staff to monitor the PA and check hunting and poaching.

3. There is a small tourist information facility, which does not provide basic facilities for visitors.
4. Wildlife research in the sanctuary is minimal, with just a low level of participation of NGOs and other organizations.
5. Some of the local people are not in favour of the sanctuary as they want to settle in Tale Valley because some land is available in Ziro.

Immediate Actionable Points

1. A separate Wildlife Division should be created for the management of Tale Wildlife Sanctuary. Currently the sanctuary is being managed by Hapoli Forest Division, a territorial division with different priorities.
2. The staff of the sanctuary is inadequate. The current management plan has proposed that the strength of the staff be enhanced. This proposal should be approved by the government and staff members posted for effective management.
3. Although the sanctuary has sufficient funds for monitoring and other activities, funds are needed for development of infrastructure (staff quarters, watch towers and monitoring trails).
4. Anti-poaching camps need to be constructed immediately and patrolling paths need to be laid inside the sanctuary for easy movement of the patrolling teams.
5. Proper documentation of important activities such as patrolling, offences and visitor details needs to be started immediately.
6. The capacity of the frontline staff needs to be enhanced for wildlife management, and monitoring equipment should be provided to the frontline staff. Some of the officers and staff should be provided specialised wildlife training.
7. A visitor information centre needs to be created and an eco-tourism plan developed with the participation of local communities.
8. Baseline data need to be established immediately for the populations of all the important wildlife species of the sanctuary. Similarly, details of the flora of the sanctuary should be documented.
9. Researchers from local universities, colleges and NGOs must be encouraged to undertake research activities in the sanctuary, preferably for management-related issues.

Evaluators

Dr. Pradeep Vyas, Former CWLW, Government of West Bengal
Dr. Umesh Kumar Tiwari, Scientist-B, Botanical Survey of India, Arunachal Pradesh
Dr. Bibhuti Lahkar, Scientist-E, AARANYAK, Assam
Dr. Bivash Pandav, Scientist-F, WII

4. Yordi Rabe Subse Wildlife Sanctuary, Arunachal Pradesh

MEE Score- 57.50% (Fair)

Management Strengths

1. The entire extent of 397 km² of Yordi Rabe Subse Wildlife Sanctuary (YRS WLS) is covered with pristine forest, with almost no biotic interference due to its remoteness and difficult terrain. It has a very low human density in the fringes. The reserve forest between the WLS and villages acts as a buffer.
2. The sanctuary is well known for its biodiversity, including the tiger, leopard, clouded leopard, Mishimi takin, black-necked crane and Asiatic black bear.
3. The sanctuary is a part of a greater conservation landscape and is connected to Daporijo Forest Division, in the central part of Arunachal Pradesh.

4. The sanctuary has a unique and beautiful environment, with fresh and jubilant streams.

Management Weaknesses

1. YRS WLS has no sanctioned staff strength, and there are few staff postings in the WLS. This adversely affects the patrolling at the difficult terrain.
2. The infrastructure is lacking in almost all aspects, i.e. protection camps, patrolling equipment, monitoring and survey equipment, etc.
3. No demarcation of the WLS exists on ground.
4. The proposed road network and irrigation and hydropower projects in the area may pose a threat to the wildlife of the WLS.
5. The information available about the key animal species is very poor, and there are almost no monitoring systems in place.

Immediate Actionable Points

1. The current management plan should be reviewed, and zonation should be created within the WLS.
2. A staff should be sanctioned for YRS by a government notification, and staff postings should be made to ensure that there is sustainable management.
3. YRS WLS should be managed under a new separate Wildlife Division to maintain the focus on wildlife management. The current system of its management under a territorial division cannot do justice to its management due to the different priorities of the management.
4. Sufficient funds should be provided in a timely manner for development of infrastructure such as anti-poaching camps, staff quarters, watch towers, monitoring trails and equipment and for eco-development activities.
5. Proper documentation (patrolling, offences, visitor details, wildlife sightings, etc.) should be started immediately.
6. Officers and staff members should be imparted wildlife training (diploma and certificate courses).
7. A visitor information centre needs to be created, and an eco-tourism plan needs to be developed with the active participation of local communities.
8. Researchers from local universities, colleges and NGOs should be encouraged to take up research activities in the WLS. Baseline population data should be collected for all the important species of the WLS.

Evaluators
Dr. Pradeep Vyas, Former CWLW, Government of West Bengal
Dr. Umesh Kumar Tiwari, Scientist-B, Botanical Survey of India, Arunachal Pradesh
Dr. Bibhuti Lahkar, Scientist-E, AARANYAK, Assam
Dr. Bivash Pandav, Scientist-F, WII

ASSAM

Following are key points of MEE conducted in Marat Longri WLS, Nambhor WLS, Nambhor-Doigrung WLS, Pani-Dihing WLS and Pobitra wildlife sanctuary of Assam:

1. The infrastructure in all evaluated wildlife sanctuaries is extremely poor which is adversely affecting the management.

2. The sanctuaries are extremely short of frontline staff to monitor the PA and ensure integrity especially preventing hunting except in Pobitra WLS.

3. There is acute shortage of funds which is adversely affecting all aspects of management including in famous Pobitra WLS.
4. Local communities living around the sanctuaries are heavily dependent on evaluated WLS's for cattle grazing and fishing. The high human density around the sanctuaries exerts an extremely high biotic pressure on limited natural resources of these WLS's.
5. The management plan has expired in most of evaluated WLS.
6. Lack of scientific research especially related to management issues is lacking in all the WLS's.
7. The encroachment, illegal tree feeling, human elephant conflicts and invasive plant species are some of key challenges of evaluated WLS.
8. Trained manpower lacks (with some exceptions) at all ranks.
9. The management of all the wildlife sanctuaries within the Karbi-Anglong Autonomous Hill District Council jurisdiction is in terrible condition and this system needs to be reviewed to save these PA's.

5. Marat Longri Wildlife Sanctuary, Assam
MEE Score- 34.16% (Poor)

Management Strengths

1. "Marat Longri" is a Karbi term meaning "territory of wildlife". From time immemorial, the area has had abundant wildlife, and now it is the largest wildlife sanctuary in the hill districts of Assam.
2. The sanctuary has several sacred groves, known as "inglongkiri" in the Karbi language. Ten rivers originate from this sanctuary.
3. The sanctuary plays a major role in preventing shifting cultivation.
4. Marat Longri Wildlife Sanctuary is a part of the Dhansiri Lumding Elephant Reserve.

Management Weaknesses

1. There are village enclaves inside the sanctuary.
2. There is illegal felling of trees in the sanctuary.
3. Extremely poor staff strength and insufficient fund flow renders the sanctuary a weakly managed status.
4. Till recently the area was affected by insurgency.

Immediate Actionable Points

1. A management plan should be prepared immediately and implemented.
2. As the sanctuary is large in size (451 km^2), a separate wildlife division should be created.
3. There is a need to create a visitor information centre and develop an eco-tourism plan with the participation of the local communities and the Karbi Anglong Autonomous Hill District Council.
4. A strategy should be developed and implemented to involve the local communities in the management of the sanctuary.
5. Sufficient funds should be provided for development of infrastructure, habitat management, protection and other activities according to a management plan that is to be written and approved. Funds should be release in time.
6. The sanctuary should have a dedicated website, which should be updated regularly.

Evaluators
Dr. Pradeep Vyas, Former CWLW, Government of West Bengal
Dr. Umesh Kumar Tiwari, Scientist-B, Botanical Survey of India, Arunachal Pradesh
Dr. Bibhuti Lahkar, Scientist-E, AARANYAK, Assam
Dr. Bivash Pandav, Scientist-F, WII

6. **Nambor Wildlife Sanctuary, Assam**

MEE Score- 42.50% (Fair)

Management Strengths

1. Nambor Wildlife Sanctuary is a part of India's first notified reserve forest, Nambor Reserve Forest (1872).
2. It is part of the larger conservation landscape of Kaziranga–Karbi Anglong–Intanki Elephant Reserve.
3. Six plant species are endemic to Nambor Wildlife Sanctuary.
4. There are seven hot-springs in the sanctuary, which attract wildlife from adjoining areas.
5. Seven species of primates are found in the sanctuary.

Management Weaknesses

1. National Highway (NH 39) passes through the sanctuary.
2. There is encroachment of the sanctuary towards Doigrung riverside.
3. Lack of Infrastructure in the sanctuary is adversely affecting its management.
4. High level of human–elephant conflict.

Immediate Actionable Points

1. The famous Nambor forest has been divided into two sanctuaries, namely Nambor Wildlife Sanctuary and Nambor-Doigrung Wildlife Sanctuary, under two territorial divisions. It is suggested that both the PAs be administered under one Wildlife DFO under the authority of the CWLW, Assam.
2. The current sanctioned strength of the frontline staff should be reviewed against the current management needs, and new staff members should be posted immediately.
3. Joint patrolling with the adjoining PA/territorial division should be started immediately for better coordination. Exchange of information should take place at the field level as well as at the DFO level.
4. The current draft management plan should be approved immediately.
5. Sufficient funds should be provided for development of infrastructure and for other management plan objectives. Funds should be released on time.
6. Researchers from the local university, colleges and NGOs must be encouraged to conduct research in the sanctuary. Baseline population data should be collected immediately for all important species, and the populations of these species must be monitored systematically.
7. A visitor information centre needs to be created. An ecotourism plan needs to be prepared in consultation with local communities and the Karbi Anglong Autonomous Hill District Council and implemented.
8. The sanctuary should have a dedicated website, which need to be updated on a regular basis.
9. The mid-level officers should be sent for training in wildlife management.

Evaluators
Dr. Pradeep Vyas, Former CWLW, Government of West Bengal
Dr. Umesh Kumar Tiwari, Scientist-B, Botanical Survey of India, Arunachal Pradesh

Dr. Bibhuti Lahkar, Scientist-E, AARANYAK, Assam
Dr. Bivash Pandav, Scientist-F, WII

7. Nambor-Doigrung Wildlife Sanctuary, Assam

MEE Score- 48.33% (Fair)

Management Strengths

1. Nambor-Doigrung Wildlife Sanctuary is a part of India's first notified reserve forest of India, the Nambor Reserve Forest (1872).
2. It is part of the larger conservation landscape of Kaziranga–Karbi Anglong–Intanki Elephant Reserve.
3. Six plant species are endemic to Nambor-Doigrung Wildlife Sanctuary.
4. There are seven hot springs in the sanctuary of tourist's attraction.
5. Seven species of primates are found in the sanctuary.

Management Weaknesses

1. The tea gardens nearby exert extremely high biotic pressure on the sanctuary.
2. NH 39 passes through the sanctuary.
3. Lack of approved management.
4. Lack of dedicated staffs for the PA.
5. Very high human–elephant conflict.
6. Lack of scientific research related with the sanctuary.
7. Paucity of sufficient number of anti-poaching camps.

Immediate Actionable Points

1. A management plan should be prepared and got approved immediately for implementation.
2. Dedicated staffs need be posted based on the assessment made on the need for the sanctioned strength.
3. Middle-level officers should be trained in wildlife management.
4. A new anti-poaching camp needs to be constructed near the hot springs.
5. The possibility of bringing Nambor and Nambor-Doigrung wildlife sanctuaries under one wildlife division directly under the command of the CWLW, Assam should be explored.
6. The famous Nambor forest has been divided and two wildlife sanctuaries, namely Nambor Wildlife Sanctuary and Nambor-Doigrung Wildlife Sanctuary, formed under two different territorial divisions. Joint patrolling should be started immediately, and there must be flow of information at the field level and DFO level.
7. Researchers from the local university, colleges and NGOs must be encouraged to conduct research in the sanctuary. Baseline population data should be collected for all the major wildlife species and the populations should be monitored systematically.
8. A visitor information centre needs to be created. An ecotourism plan needs to be developed in consultation with local communities and the Karbi Anglong Autonomous Hill District Council.

Evaluators
Dr. Pradeep Vyas, Former CWLW, Government of West Bengal
Dr. Umesh Kumar Tiwari, Scientist-B, Botanical Survey of India, Arunachal Pradesh
Dr. Bibhuti Lahkar, Scientist-E, AARANYAK, Assam
Dr. Bivash Pandav, Scientist-F, WII

8. Pobitora Wildlife Sanctuary, Assam

MEE Score- 74.16% (Good)

Management Strengths

1. Pobitora Wildlife Sanctuary is a home of the globally threatened *Rhinoceros unicornis*, which is a Schedule I species under the Wildlife (Protection) Act, 1972.
2. Because the PA is managed efficiently, the rhino population has been increasing for decades. As a result, the PA has been able to provide rhinos for translocation to Manas National Park under Indian Rhino Vision 2020.

Management Weaknesses

1. Intense cattle grazing is poses a serious threat of epidemics for the park's wildlife.
2. Pobitora Wildlife Sanctuary is demarcated by a man-made boundary in want of natural boundaries.
3. Yearly heavy floods might severly affect the rhino population.
4. Lack of connectivity of Pobitora Wildlife Sanctuary with neighbouring protected areas renders it as an isolated island prohibiting flow of the gene pool.

Immediate Actionable Points

1. Timely release of adequate funds should be provided for maintenance, habitat management, protection and other activities.
2. A management plan should be written and implemented immediately.
3. The infrastructure should be improved. There should be sufficient staff quarters, bridges should be constructed, etc.
4. Intensive habitat management activities should be initiated in the form of grassland and weed management, etc to enhance the habitat and minimize straying of rhinos outside the park.

Evaluators

Dr. Pradeep Vyas, Former CWLW, Government of West Bengal
Dr. Umesh Kumar Tiwari, Scientist-B, Botanical Survey of India, Arunachal Pradesh
Dr. Bibhuti Lahkar, Scientist-E, AARANYAK, Assam
Dr. Bivash Pandav, Scientist-F, WII

9. Pani-Dihing Wildlife Sanctuary, Assam

MEE Score- 31.66% (Poor)

Management Strengths

1. Pani Dihing Wildlife Sanctuary is a conglomerate of 16 water bodies, declared to conserve the flood plain ecosystem of the river Brahmaputra, particularly the avifauna.
2. The area gets inundated with the floodwaters of the Brahmaputra during the wet season and dries up by mid January.
3. The dry lands of the sanctuary provide grazing areas for geese that winter in the wetlands of Sibsagar District and along the river Brahmaputra.
4. The flooding of the 16 wetlands of Pani-Dihing replenishes the fish fauna and helps the conservation of this ecosystem.

Management Weaknesses

1. Local communities living around the sanctuary are heavily dependent on Pani-Dihing for cattle grazing and fishing. The high human density around the sanctuary exerts an extremely high pressure on its limited natural resources.
2. Shortage of staff members and an insufficient flow of funds put the management of the sanctuary in an extremely weak position.
3. Because there are no active habitat management practices, many parts of the sanctuary are getting encroached by invasive species such as *Ipomea carnea*.

Immediate Actionable Points

1. The preparation of a new management plan should start immediately with the active involvement of all the stakeholders.
2. The sanctuary should be managed as a separate range with adequate staff strength.
3. The protection strategy of the sanctuary needs to be improved greatly. Adequate manpower and infrastructure must be deployed.
4. The populatin census tasks must be monitored and documented on an annual basis.
5. A visitor information centre needs to be created, and an eco-tourism plan must be developed with participation of the local communities A strategy should be developed and implemented for the participation of local communities in the management of the sanctuary.
6. Pani-Dihing Wildlife Sanctuary should have a dedicated website, which should be updated on a regular basis.

Evaluators

Dr. Pradeep Vyas, Former CWLW, Government of West Bengal
Dr. Umesh Kumar Tiwari, Scientist-B, Botanical Survey of India, Arunachal Pradesh
Dr. Bibhuti Lahkar, Scientist-E, AARANYAK, Assam
Dr. Bivash Pandav, Scientist-F, WII

MANIPUR

Keibul Lamjao NP, being a part of Loktak Lake (Ramsar site) it is automatically integrated with the wider ecological network.The State organizes an annual Sangai festival which has helped to put Loktak and Keibul Lamjao National Park on International Map.Most of the frontline staff are not trained in wildlife management especially on fresh water ecosystem as the Park has a very specialized ecosystem. The PA does not have an approved Management Plan since 2009, which is critical for the management.There is a need to establish second population of Sangai in State to minimize the threats that a single population faces which is proposed at another identified site.Weed species like *Lantana camara* and *Eupatorium/Chromalena* needs to be uprooted. Submerged species like *Hydrilla verticillata* should also be eradicated.

10. Keibul Lamjao National Park, Manipur

MEE Score- 73.33% (Good)

Management Strengths

1. Values have been systematically identified, assessed and monitored.
2. The site has been identified correctly and systematically categorized with zonation plans.
3. The site safeguards a large number of threatened biodiversity values.
4. The park has an effective protection strategy in place.
5. The level of human–wildlife conflicts has been reduced.
6. The site is fully integrated into the wider network/landscape. Being a part of Loktak Lake (Ramsar site) it is automatically integrated with the wider ecological network.
7. Major livelihood issues are addressed by the PA management. A number of eco-development activities have been taken up and women Self Help Groups have been formed.
8. The populations of all threatened or endangered species are stable.
9. Most of the neighbours and local communities are supportive of the management of the PA.
10. The Sangai has been designated a cultural asset. Hence, the communities offer considerable support.
11. A large number of local people who understand *phumdis* and their floating patterns are employed by the park.

12. The state organizes an annual Sangai festival, which has helped put Loktak and Keibul Lamjao National Park on the international map.

Management Weaknesses

1. Most of the frontline staff are not trained in wildlife management, especially as Keibul Lamjao Park has a very specialized freshwater ecosystem.
2. A functional complaint handling system is not in place, and there is no mechanism for following up with complaints.
3. Nature interpretation facilities are not in place. There are few trained guides.
4. The park has not had an approved management plan since 2009.

Immediate Actionable Points

1. Appropriate numbers of frontline and mid-level staff need to be trained in wildlife management.
2. The Sangai census and population estimation exercise needs to be carried out more frequently during the year.
3. There is a need to establish a second population of the Sangai in the state to minimize the threats that the single population faces.
4. There is an urgent need to have an approved management plan in place for effective management of the park.
5. Incidences of fire should be prevented so that the material available for development of *phumdis* is enhanced.
6. Weeds such as *Lantana camara* and *Eupatorium* (*Chromalaena*) need to be eradicated. Submerged species such as *Hydrilla verticillata* should also be eradicated.
7. Adequate funds need to be released from the CSS and state funds.
8. A complaint handling system needs to be put in place.

Evaluators
Shri T.T.C. Marak, Former CWLW, Government of Meghalaya
Dr. B.K. Mishra, Former Scientist, Wildlife Institute of India, Dehradun
Dr. Yogesh Dubey, Scientist, IIFM, Bhopal
Shri Salvador Lyngdoh, Scientist-D, WII Dehradun

MEGHALAYA

Meghalaya has a record of fairly good management practices. The fact that the Management Plan here in respect of Nongkhyllem WLS has been in place from 2001 through 2022 shows that irrespective who's posted, there is continuity. There are also prospects of increasing landscape continuity as efforts are on to increase PA areas from the vicinity, which are community forests. The community are also supportive of conservation. The major constraints lie in largely untrained frontline staff, poor research and census being carried out only when Elephant Census are conducted. The need to collaborate with local/regional research institutes to initiate research in key faunal species especially in endangered species is strongly recommended. Standardizing frequency and periodicity of wildlife estimation would go a long way in looking at stability/viability of wildlife population.

11. Nongkhyllem Wildlife Sanctuary, Meghalaya
MEE Score- 79.17% (Very Good)
Management Strengths

1. The biotic interference in the park has been significantly reduced.
2. The zonation has been done in terms of core and buffer zones.
3. The PA has a duly notified eco-sensitive zone.

4. There is continuity between the management plan for the period from 2001 onwards and the current management plan ending in 2022.
5. The site is fully integrated into the wider network/landscape. The sanctuary has been carved out of the existing reserved forest, and hence the natural and geomorphological settings are contiguous. There are proposals to extend the present area of the existing sanctuary area.
6. Substantial livelihood issues are addressed by the PA management.
7. Systematic evaluation and routine reporting of management-related trends are undertaken.
8. The PA enjoys support from the neighbouring communities.

Management Weaknesses

1. The PA lacks a coordinated system of conducting wildlife census.
2. Only a few trained officers and frontline staff have been posted at the site.
3. There is no coordinated research on wildlife-related issues in the PA.

Immediate Actionable Points

1. More members of the staff must be trained in wildlife management.
2. There is a need to streamline and standardize the frequency and periodicity of carrying out wildlife census of key animal species of the area, especially the endangered species.
3. The management of the PA needs to collaborate with local research institutions to initiate research on key faunal and floral species and other important management-related issues.

Evaluators
Shri T.T.C. Marak, Former CWLW, Government of Meghalaya
Dr. B.K. Mishra, Former Scientist, Wildlife Institute of India, Dehradun
Dr. Yogesh Dubey, Scientist, IIFM, Bhopal
Shri Salvador Lyngdoh, Scientist-D, WII Dehradun

MIZORAM

Being in a landlocked area most of the PAs in Mizoram are free from human and biotic interference. The PAs are integrated into a wider network/landscape. Livelihood issues dwellers fringe forest are addressed. The local NGO support in Mizoram is very strong working in tandem with the PA management. One of the major constraints to good management is that the average age of the staff is around 50 years and there has not been periodic recruitment of fresh frontline staff. Untimely release of funds is the complaint of PA managers. There are three villages still in one of the Pas which need to be relocated and rehabilitated. The APOs were not prepared as per the Management Plan and were more adhoc. The wildlife census needs to be carried out methodically and periodically.

12. Pualreng Wildlife Sanctuary, Mizoram
MEE Score- 73.21% (Good)
Management Strengths

1. The sanctuary is free of biotic and human interference.
2. The zonation has been done in terms of core, tourism and eco-restoration zones.
3. There is continuity between the management plans for the period from 2004 onwards and the current management plan, ending in 2020.

4. The site is fully integrated into the wider network/landscape. The sanctuary is surrounded by two forest divisions and large tracts of community forest, which provide ample connectivity.
5. A large number of livelihood issues have been addressed by the PA management.
6. Local NGOs provide much-needed support for spreading awareness and working with the local community.
7. The PA enjoys support from the neighbouring communities.
8. The sanctuary has adequate frontline staff in position.

Management Weaknesses

1. The PA lacks a coordinated system of conducting wildlife census.
2. There is a lack of trained manpower in wildlife management.
3. The average age of most staff is above 50 years.
4. The sanctuary management lacks in dedicated fleet of vehicles.
5. The eco-sensitive zone is yet to be notified.
6. Sanctuary has a history of untimely release of funds.

Immediate Actionable Points

1. There is an immediate need for relatively younger staff trained in wildlife management.
2. The process of notification of Eco-sensitive zones need to be expedited.
3. Annual Plan of Operations (APOs) need to be prepared on the lines of the proposed actions in the management plan.
4. Wildlife census needs to carried out more methodically and periodically. Data must be collected and recorded to establish the population trends of important wildlife species.

Evaluators
Shri T.T.C. Marak, Former CWLW, Government of Meghalaya
Dr. B.K. Mishra, Former Scientist, Wildlife Institute of India, Dehradun
Dr. Yogesh Dubey, Scientist, IIFM, Bhopal
Shri Salvador Lyngdoh, Scientist-D, WII Dehradun

13. Thorangtlang Wildlife Sanctuary, Mizoram
MEE Score- 67.86% (Good)

Management Strengths

1. The zonation has been done in terms of core, buffer and tourism zones.
2. There is continuity between the management plan for the period from 2003 onwards and the current management plan, which ended in 2017. A new management plan is being written. As there has not been many changes in the objectives, the previous plan is being followed.
3. The site is fully integrated into the wider network/landscape. The sanctuary is surrounded by two forest divisions, Dampa Tiger Reserve and large tracts of community forest thus providing ample corridor connectivity.
4. Local NGOs provide much-needed support for spreading awareness and working with the local community.
5. There are five registered EDCs within the sanctuary.
6. Three villages that were inside the sanctuary have be rehabilitated outside.
7. The site has an effective protection strategy.

Management Weaknesses

1. The sanctuary lacks a coordinated system of conducting wildlife census.

2. There is a lack of manpower trained in wildlife management.
3. The PA lacks regular frontline staff at the levels of Forester and Forest Guard.
4. Eco-sensitive zone is yet to be notified.
5. There is no support from national-level NGOs.
6. Funds are not released in a timely fashion.

Immediate Actionable Points

1. There is an immediate need to get the staff trained in wildlife management.
2. There is an urgent need to recruit regular frontline staff.
3. An eco-sensitive zone should be notified.
4. Annual Plan of Operations need to be prepared on the lines of the proposed actions in the management plan.
5. Wildlife census needs to carried out more methodically, and periodically data must be collected and recorded to establish the population trends of important wildlife species.
6. Efforts may be made to rehabilitate some dispersed human settlements in the areas north of the sanctuary to extend the sanctuary.

Evaluators
Shri T.T.C. Marak, Former CWLW, Government of Meghalaya
Dr. B.K. Mishra, Former Scientist, Wildlife Institute of India, Dehradun
Dr. Yogesh Dubey, Scientist, IIFM, Bhopal
Shri Salvador Lyngdoh, Scientist-D, WII Dehradun

SIKKIM

Sikkim has been a tourist state and thus PAs have related issues to deal with. The presence of army in the higher reaches help in the protection of wildlife habitats. The Management Plans have been drawn with active participation of stakeholders. Threat analysis of rhododendrons in the Sanctuary has not been done and visitors management inadequate. There is a need for zero waste management. The department needs to work in close cooperation of local bodies like the Dzomsa. Specific to Khangchendzonga, since KNP is located inside the Khangchendzonga Biosphere Reserve, there is a need for developing a comprehensive management plan addressing concerns of both KNP and KBR. Recommendations from research findings need to be incorporated in the Management Plans. The existing frontline staff is inadequate and needs to be enhanced by creation of additional posts or redeployment. Buffer area needs to be strengthened with the support of local communities through program of eco development and other ongoing developmental program of different agencies.

14. Khangchendzonga National Park, Sikkim

MEE Score- 77.50% (Very Good)

Management Strengths

1. The values have been identified and are systematically recorded.
2. The site does not have a very high level of biotic interference as it is almost inaccessible from different sides. There is also an international border along the northern and eastern sides.
3. The site has been properly identified, and zonation has been carried out.
4. Most of the stakeholders participate in the planning process.
5. Habitat restoration programmes are generally planned and monitored well.
6. The protection strategy of the forest department is good and effective.

7. The site is integrated fairly well into the network and landscape as part of the broad Himalayan alpine and sub-alpine landscape and ecosystem.
8. The management personnel are highly motivated, and they are allocated works for achievement of the management goals.
9. All the neighbours and communities are supportive of the PA management. The relationship the management enjoys with them is very good. An intelligence network is also in place.
10. The area is a renowned tourist destination and therefore gets tremendous national and international attention. It is also a UNESCO World Heritage Site.
11. There are a number of active NGOs that assist the management with eco-tourism, waste management, awareness generation and providing livelihood support for the local populace.

Management Weaknesses

1. There are very few personnel trained in wildlife management.
2. Keeping in mind the vastness of the area, difficult terrain and variety of activities, the available manpower and supportive infrastructure are inadequate.
3. The threat analysis of the park has not been carried out systematically.
4. The status of the wildlife is difficult to assess. Census of all the threatened species are not carried out regularly. This is mainly because of the terrain and the different methodologies needed for different species.

Immediate Actionable Points

1. Since Khangchendzonga National Park (KNP) is located inside Khangchendzonga Biosphere Reserve (KBR), there is a need to develop a comprehensive management plan addressing the requirements of the national park as well as the biosphere reserve. This comprehensive management plan must take into account the recommendations made from scientific studies carried out in the park.
2. Threat analysis needs to be carried out spatially and temporally for the area with the involvement of different stakeholders so as to develop a baseline for subsequent monitoring.
3. The existing strength of the frontline staff is inadequate, and it needs to be enhanced by the creation of additional posts or redeployment. The office of the DFO, KNP should be located closer to the park so that management is more effective and the presence of the department is felt strongly by the local communities.
4. The department must work in close coordination with the Dzomsa (traditional local system of governance) in the area so that the participation of the local communities is enhanced.
5. The buffer area plan needs to be strengthened with the support of local communities through the eco-development programme and other ongoing developmental programmes of different agencies.
6. Immediate actions are required to conduct a census of all the threatened species reported from the site.
7. The park should continue to attract institutions and individuals for scientific research.

<u>Evaluators</u>

Shri T.T.C. Marak, Former CWLW, Government of Meghalaya
Dr. B.K. Mishra, Former Scientist, Wildlife Institute of India, Dehradun
Dr. Yogesh Dubey, Scientist, IIFM, Bhopal
Shri Salvador Lyngdoh, Scientist-D, WII Dehradun

15. Shingba Wildlife Sanctuary, Sikkim

MEE Score- 61.20% (Good)

Management Strengths

1. The sanctuary has landscape connectivity with Khangchendzonga National Park and Khangchendzonga Biosphere Reserve.
2. The sanctuary has a good diversity of *Rhododendron* species. A total of 29 species have been documented from the sanctuary.
3. The process of management planning has been done with proactive participation of stakeholders and due identification of conservation values, addressing the landscape integration issue.

Management Weaknesses

1. There is paucity of trained officers and staff in wildlife management.
2. The threat analysis of the sanctuary has not been carried out systematically.
3. The sanctuary faces huge biotic interferences from cattle camps.
4. Zonation is not systematically delineated.
5. Absence of interpretation centre renders the visitor's management inadequate.
6. Visibility of litters inside the sanctuary is a matter of concern and indicative of weak monitoring mechanism.
7. Irregular wildlife census schedule has resulted in lack of information on the status of rare and threatened species.

Immediate Actionable Points

1. A management plan need be immediately prepared for the sanctuary and also incorporating the recommendations of scientific studies carried out in the wildlife sanctuary in the past.
2. Threat analysis needs to be carried out for the area based on which monitoring protocols be also developed.
3. The sanctuary must tackle the biotic pressures created by the cattle camps.
4. The staff should be provided training in conducting wildlife census and monitoring.
5. New management plan of the sanctuary should clearly demarcate and describe the different zones.
6. The management should carry out wildlife census on a regular basis to generate information on the population status of threatened species.
7. A plan must be developed for bringing about zero littering inside the sanctuary.
8. The sanctuary management must work in close coordination with the Dzomsa (traditional local system of governance) in the area for enhanced participation of local communities.

Evaluators

Shri T.T.C. Marak, Former CWLW, Government of Meghalaya
Dr. B.K. Mishra, Former Scientist, Wildlife Institute of India, Dehradun
Dr. Yogesh Dubey, Scientist, IIFM, Bhopal
Shri Salvador Lyngdoh, Scientist-D, WII Dehradun

TRIPURA

Sepahijala Wildlife Sanctuary is one of the coveted places for people to visit. Most values and threats have been systematically identified and assessed. The PA has an updated and approved wildlife management plan in place. Stakeholders routinely and systematically participate in the planning processes. There is adequate staff strength for the effective management of the PA. However, management plans and related information with reference to the PA management needs to be digitalised. The front line and mid-level staff needs to be trained on

wildlife and PA management related issues. Proper methodology and periodicity for conducting wildlife census needs to be standardised. Camera trapping needs to done to assess the population status of clouded leopard in the PA. More focus needs to be done on research on management related aspects of the PA. The PA may establish long term collaboration with any research institution in this regard.

16. Sepahijala Wildlife Sanctuary, Tripura

MEE Score- 74.10% (Good)

Management Strengths

1. Most of the values and threats have been systematically identified and assessed.
2. The PA has updated and approved and operational wildlife management plan.
3. The site safeguards a large number of threatened biodiversity values.
4. Stakeholders routinely and systematically participate in the planning processes.
5. There is no human–wildlife conflicts around the PA.
6. The staff strength is adequate for the effective management of the PA.
7. Livelihood issues of the forest-fringe communities have been effectively addressed using a large number of programmes initiated by the PA management for eco-development committees.
8. There is adequate eco-tourism infrastructure to address the needs of the tourists.

Management Weaknesses

1. There is some human and biotic interference from outside the PA at the site.
2. The prescriptions of the management plan were found not to be adequately addressed.
3. Census of key animal species are not conducted according to a standardized methodology and periodicity.
4. The site is not integrated into the wider network/ landscape.
5. The resource allocation at the sanctuary is ad hoc coupled with untimely release of funds.
6. The frontline and mid-level staff are not trained in wildlife management.

Immediate Actionable Points

1. All the management plans and related information need to be digitalized.
2. The frontline and mid-level staff need to be trained in wildlife- and PA management-related issues.
3. The methodology and periodicity of wildlife census need to be standardized.
4. Camera trapping needs to be conducted to assess the population status of Clouded Leopard in the PA.
5. The PA may establish a long-term collaboration with any research institution for carrying out focussed research on management-related aspects of the PA.
6. A web page providing information about the PA needs to be created and linked to the website of the Tripura Forest Department.

Evaluators

Shri T.T.C. Marak, Former CWLW, Government of Meghalaya
Dr. B.K. Mishra, Former Scientist, Wildlife Institute of India, Dehradun
Dr. Yogesh Dubey, Scientist, IIFM, Bhopal
Shri Salvador Lyngdoh, Scientist-D, WII Dehradun

CHAPTER FOUR

WAY FORWARD

The present MEE process has provided valuable insights into the management processes and practices in all NP&WLS. The strengths, weaknesses and immediate actionable points have been described in respect of all 143 NP&WLS included in this report. It is observed that NP&WLS have to maintain these strengths and address their weaknesses in a systematic manner. Efforts should be made to implement the immediate actionable points indicated for each NP&WLS. It is critical that each NP&WLS has a good science based Management Plan formulated through a participatory process. Till such time the Management Plans are prepared/ revised/ updated the Annual Plan of Operation (APOs) should take into account actions required for implementing the results of the evaluation. Overall, there should be an evidence based decision making system. The MoEFCC must ensure that adequate funds are provided and a system of compliance monitoring is put in place. The 3 PA which were not evaluated by the MEE Committee, the specific recommendations are given. The Government of India should incorporate these recommendations to overcome the issues discussed by the MEE Committee on urgent basis for Management of these three sites.

ANNEXURE – I

List of 16 Independent Regional Expert Committees (RECs) for Management Effectiveness Evaluation (MEE) of 146 National Parks and Wildlife Sanctuaries in 2018-19

Region	Team	Chairman	Member 1	Member 2	WII Faculty Member 3
Northern	1	**Shri B.S. Bonal** Former ADG (PT) & MS, NTCA	**Dr. Khurshid Ahmad** Professor, Sher-e-Kashmir University of Agriculture Sciences and Technology, Jammu & Kashmir	**Dr. Justus Joshua** Green Peace Foundation, Gujarat	**Dr. S. Sathyakumar** Scientist, Wildlife Institute of India, Dehradun
	2	**Dr. V.K. Melkani** Former Chief Wildlife Warden, Government of Tamil Nadu	**Dr. Vibhu Prakash** Scientist, Vulture Breeding Centre, Chandigarh	**Dr. Jeet Ram** Faculty Member, Kumaun University, Nainital	**Dr. K. Sivakumar** Scientist, Wildlife Institute of India, Dehradun
	3	**Shri S.S. Srivastva** Former PCCF & HoFF, Govt. of Odisha	**Dr. D.S. Shrivastava** Former Professor, Patna University, Patna	**Dr. Afifullah Khan** Faculty, Aligarh Muslim University, Aligarh	Dr. **V.P.** Uniyal Scientist, Wildlife Institute of India, Dehradun
	4	**Dr. Anmol Kumar** Former DG, FSI, Dehradun	**Dr. Dipankar Ghose** Director, Species and Landscapes Programme WWF-India	**Dr. Rathin Barman** Joint Director, Wildlife Trust of India	**Shri Ajay Srivastav** Former Registrar, Wildlife Institute of India, Dehradun

Region	Team	Chairman	Member 1	Member 2	WII Faculty Member 3
Southern	1	**Dr. S.K. Khanduri** Former IG (WL), MoEFCC, New Delhi	**Dr. E.A Jayson** Research Coordinator, Kerala Forest Research Institute, Peechi, Thrissur Kerala	**Dr. Arun Mani Dixit** Centre for Environment and Social Concerns	**Shri Vinod D.K.** Scientist, Wildlife Institute of India, Dehradun
	2	**Shri Hari Kumar** Former Chief Wildlife Warden, Government of Kerala	**Dr. Rajah Jayapal** Scientist, SACON, Coimbatore	**Dr. P.K. Mathur** Former Dean, WII	**Dr. Bitapi Sinha** Scientist, Wildlife Institute of India, Dehradun
	3	**Shri P. Anur Reddy** Former Principal Chief Conservator of Forest, Government of Karnataka	**Dr. S. Narendra Prasad** Former Faculty, SACON, Hyderabad	**Shri B.C. Choudhury** Former Faculty, WII	**Dr. Abhijit Das** Scientist, Wildlife Institute of India, Dehradun
	4	**Shri B.K. Singh** Former PCCF, Karnataka	**Dr. Lalit Kumar Sharma** Scientist-C, Zoological Survey of India (ZSI), Kolkata	**Dr. P.S. Easa** Former Scientist, KFRI, Kerala	**Dr. Asha Rajvanshi** Senior Professional Fellow, Wildlife Institute of India, Dehradun

Region	Team	Chairman	Member 1	Member 2	WII Faculty Member 3
Eastern	1	**Shri Azam Zaidi** Former Chief Wildlife Warden, Government of West Bengal	**Shri P. Krishna Mohan** Former APCCF (Wildlife) Odisha	**Dr. Diwakar Sharma** Director, Programme Management, M&E, WWF-India	Dr. Bilal **Habib** Scientist, Wildlife Institute of India, Dehradun
	2	**Dr. A.K. Bhardwaj** Former PCCF (HOFF), Govt. of Kerala and Senior Professional Fellow, WII	**Dr. Ram Kumar** Manager & Project Head, Wildlife Trust of India	**Dr. Udayan Borthakur,** Head, Wildlife Genetics Division (WGD) Aaranyak, Assam	**Dr. B.S. Adhikari** Scientist, Wildlife Institute of India, Dehradun

Region	Team	Chairman	Member 1	Member 2	WII Faculty Member 3
Western	1	**Shri Rajiv Kumar Srivastava** Former PCCF, Govt. of Manipur	**Dr. Ashish David** Faculty, IIFM, Bhopal	**Dr. Nita Shah** BNHS, Mumbai	**Dr. Gautam Talukdar** Scientist, Wildlife Institute of India, Dehradun
	2	**Dr. Alok Saxena** Former Principal Chief Conservator of Forests Andaman & Nicobar Islands	**Dr. Jayant Kulkarni** Independent Scientist, Pune	**Shri Ajay Desai** Independent Biologist, Belgaum	**Dr. Suresh Kumar** Scientist, Wildlife Institute of India, Dehradun
	3	**Shri U.M. Sahai** Former Chief Wildlife Warden, Government of Rajasthan	**Dr. Advait Edgoankar** Faculty, IIM, Bhopal	**Ms. Seema Bhatt** Independent Scientist New Delhi	**Dr. S.P. Goyal** Former Scientist and Subject Matter Specialist, Wildlife Institute of India, Dehradun
	4	**Shri V. Gopinath** Former PCCF (HoFF), Govt. of Kerala	**Shri Roy P. Thomas** Former JD (Wildlife), MoEFCC and Consultant MoEFCC	**Dr. Manisha Thapliyal** Scientist-F Forest Research Institute (FRI)	**Dr. Manoj Nair** Former Scientist, Wildlife Institute of India, Dehradun

Region	Team	Chairman	Member 1	Member 2	WII Faculty Member 3
North-eastern	1	**Dr. Pradeep Vyas** Former Chief Wildlife Warden, Government of West Bengal	**Dr. Umesh Kumar Tiwari** Scientist-B, Botanical Survey of India Regional Office-Arunachal Pradesh	**Dr. Bibhuti Lahkar** Scientist-E, AARANYAK, Assam	**Dr. Bivash Pandav** Scientist, Wildlife Institute of India, Dehradun
	2	**Shri T.T.C. Marak** Former Chief Wildlife Warden, Government of Meghalaya	**Dr. B.K. Mishra** Former Faculty, Wildlife Institute of India, Dehradun	**Dr. Yogesh Dubey** Faculty, IIFM, Bhopal	**Dr. Salvador Lyngdoh** Scientist, Wildlife Institute of India, Dehradun

Photo: ***Irfan Wani***, *IFS*

भारतीय वन्यजीव संस्थान
Wildlife Institute of India
P.O. Box # 18, Chandrabani
Dehradun - 248001, Uttarakhand
Tel.: 0135 - 2640114-115, Fax: 0135 - 2640117
Website: www.wii.gov.in, Email: wii@wii.gov.in