

भारत सरकार
Government of India
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
Ministry of Environment, Forest and Climate Change
राष्ट्रीय व्याघ्र संरक्षण प्राधिकरण
National Tiger Conservation Authority

F. No. 11-1/2021-NTCA

New Delhi, the November 22nd, 2021

To,

✓ The Inspector General of Forest
& Joint Chief Executive Officer
National Authority (CAMPA)
MoEF&CC, IPB, New Delhi.

Sub: Assessment of Population Status of Tigers, Co-predators, Prey and Their Habitat in India (2021-23) - Providing funding support under CAMPA- reg.

Sir,

Reference is invited to the subject cited above. In this context, I am directed to enclose herewith a copy of project proposal "**Assessment of Population Status of Tigers, Co-predators, Prey and Their Habitat in India (2021-23)**" for your kind information. The project intends to monitor the status of tigers at pan India level and involves the National Tiger Conservation Authority (NTCA), Wildlife Institute of India (WII) and 18 Tiger Range States (TRS).

The expected outcome of the project would include not just the tiger numbers for the country, but also would provide status of other co-predators, mega herbivores, prey, habitat and human disturbances for the tiger bearing areas in the country thereby reiterating the umbrella role of tigers in biodiversity conservation. The objectives of the proposal fall within the provisions contained in section 5(b) (iii) of the CAF Act 2016.

Considering the importance of monitoring endangered species, their habitat for conservation & management, it is requested that necessary funding support for the said project may kindly be provided under CAMPA.

Encl: As above.

Yours faithfully,



(Rajendra G. Garawad)
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Copy to:

1. Sr PPS to DGF & SS, MoEF&CC, New Delhi.
2. PS to ADG (PT) & MS (NTCA).
3. PA to IGF, NTCA, New Delhi.

ASSESSMENT OF POPULATION STATUS OF TIGERS, CO-PREDATORS, PREY AND THEIR HABITAT IN INDIA (2021-2023) – PROJECT PROPOSAL

1. BACKGROUND

Tiger is a conservation dependent species. For conservation and management of any endangered species such as tiger, its status, distribution, and trends in populations needs to be monitored at regular interval so that the information derived from monitoring process may be used for designing, implementation and evaluation of success of conservation program. Such information is often also crucial for making informed decisions and prioritizing conservation investments.

Tiger Reserves in India are major strongholds for tiger conservation and act as source to repopulate tigers in other tiger bearing landscapes thereby promoting a meta population framework. The paramount requirement for conserving wild tigers in India is to first safeguard existing source populations from further depletion. Source populations of tigers are threatened by (a) poaching of tigers and their prey, (b) habitat deterioration and destruction by indiscriminate human use, and (c) by increased isolation and shrinkage of habitat. An important conservation strategy to address these threats would be to implement a technology aided smart patrolling and ecological monitoring system that would inform and guide park management of major trends in wildlife populations, illegal activities, human pressures and habitat status assisting in adaptive management.

The quadrennial All India Tiger Estimation (AITE) intends to monitor the status of tigers at pan India level and involves the National Tiger Conservation Authority (NTCA), Wildlife Institute of India (WII) and 18 Tiger Range States (TRS). The Indian tiger population status based on modern animal abundance estimation science commenced since 2006, and covers all potential tiger bearing areas (~381,000 km²) in the country. The information generated by the earlier four cycles of tiger status evaluation exercises resulted in major changes in policy and management of tiger populations and provided scientific data to fully implement provisions of the Wildlife (Protection) Act 1972, as amended in 2006, in letter and spirit. During the 5th cycle of the exercise, tiger population status in India will be assessed using abundance (the number of individuals in a population occupying the same space at the same time) and density (which is abundance scaled by area and spatial distribution of tigers). The exercise will not only arrive at tiger numbers for the country, but also would provide status of other co-predators, mega herbivores, prey, habitat and human disturbances for the tiger bearing areas in the country thereby reiterating the umbrella role of tigers in biodiversity conservation.

The AITE includes 3 sub components namely; 1) Assessment of population status at pan India level, 2) the development of technological component M-STrIPES for data collection, analysis and visualization and 3) Technical support, capacity building of Tiger Range States for implementation of AITE, M-STrIPES, data collection, data analysis and preparation of technical reports.

2. OBJECTIVES

Objective 1: The objective is to assess the status of tigers, co-predators, prey, and their habitat for the period 2021-2022 at country level, with scientific methodology (AITE).

Objective 2: Development and implementation of M-STrIPES phase III which *inter alia* includes development of apps and desktop software, web analytics for online reporting, software user manuals, and setting up database servers at NTCA & WII. (M-STrIPES)

Objective 3: Extending technical support to NTCA and capacity building of Tiger Range States in assessment of tigers, co-predators and their habitat, implementation of M-STrIPES and conduct need based research/ projects for conservation management. (Tiger Cell)

3. METHODOLOGY

The assessment would require extensive Pan India surveys across tiger landscapes involving coverage of over 3,81,400 sq km of forest areas apart from more than 5,50,000 km of foot patrol recces. The methodological approach of All India Tiger Estimation :2021-22 would be similar to the previous 4th monitoring cycle conducted during 2017-18 and involves the following three phases:

Phase I – Sampling of all current and potential tiger habitats using Phase I protocol across tiger bearing states of India by considering beat as a sampling unit. To the extent possible all data recording will be done digitally using M-STripES (Monitoring System for Tigers: Intensive Protection and Ecological Status) ecological mobile application. The phase I protocol mainly consists of : carnivore sign encounters, tiger prey abundance, vegetation, human disturbance and dung counts.

Phase II – Tiger distribution is largely dependent on the landscape characteristics and anthropogenic impacts and thereby influencing the occupancy and density of tiger and associated wildlife. In this phase, remotely sensed data (forest area, vegetation cover, forest patch size, forest core areas, elevation, distance from protected areas, drainage density etc) and variable of anthropogenic impacts (forest degradation, distance to and area of night lights, distance to and density of major roads and human footprint index) will be used for occupancy modelling and for generating landscape level indices.

Phase III – This phase involves use of spatial data of individual tigers and leopards captured through camera trapping coupled with spatial data on prey, habitat and anthropogenic factors as covariates. The tiger population estimates for all tiger landscapes will be derived by using **likelihood based Spatially Explicit Capture- Recapture (SECR) covariate framework** to correct for imperfect detection by remote cameras. For other species, relative abundance is indexed (RAI) using number of independent photo-events corrected for sampling effort (trap-nights).

4. In areas where camera trapping is difficult to execute owing to low tiger density, inaccessible terrain, law and order issues, militancy, the DNA profiling of carnivore scat, Maximum Entropy Models and distance sampling will be used for estimating minimum tiger numbers for such areas. Polygon search module of M-STripES would be developed and refined for catering for sampling high altitudes.

5. The habitat of Sundarban Tiger Reserve is unique owing to numerous creeks in delta region which bisects tiger reserve into several islets. Taking into the unique habitat a separate monitoring protocol for Sundarban has been designed by WII in consultation with State Forest Department, West Bengal. The protocol involves use of creek transects and sign surveys in channels for determining the extent, relative abundance of tigers and area occupied by tigers. A subset of the tiger reserve is used for camera trapping by following 2 sq km grid for estimating abundance and density of tiger.

6. Peer reviewed methodology: The methodology used in last 4 cycles of All India Tiger Estimation of 2006, 2010, 2014 and 2018 is scientifically robust method which was tested in Satpura – Maikal landscape of about 48,000 sq km in Madhya Pradesh covering 3,150 beats of 178 forest ranges. This study has been published in peer reviewed journal. The protocol used in 2018 cycle of AITE was reviewed by three noted International carnivore conservationists and their comments was appended in the report published.

This refined monitoring method developed from the Satpura-Maikal study uses forest beat (of 15-25 sq km) as the sampling unit. Owing to manpower available with the Forest Departments, almost all beats where tigers are likely to occur are sampled for carnivore signs, ungulate encounter rates, pellet /dung counts, habitat and anthropogenic pressures. For collection of this simple data, our forest staff is fairly competent and doesn't require higher level of technical skills or equipment. For the phase III which involves estimating tiger population and its prey, several teams of trained researchers/ biologists would be deployed in all tiger landscapes.

4. EXPECTED OUTCOMES

1. Country wide assessment of tigers, co-predators, prey and their habitat - 5th cycle
2. Ecological monitoring of Tiger Reserves and tiger landscapes & assist in implementation and collate Phase IV data from the Tiger Reserves as well as maintain National Tiger Photo Database.
3. Development and implementation of Monitoring System for Tigers, Intensive Patrolling and Ecological Status (M-STrIPES) in all tiger landscapes.
4. Spatial database on Tiger Populations and other wildlife in India and technical reports which are highly useful for tiger reserve management.
5. Training & capacity building at periodic interval for ecological monitoring, research, and management of Tiger and co-predator in Tiger Reserves and tiger bearing forest areas.
6. Assessment of developmental projects in tiger landscapes and prescribing appropriate mitigation measures/ strategies.
7. A database on research projects implemented in different tiger landscapes with focus on tiger conservation.
8. Design, conduct and communicate applied and basic research to enable NTCA to address specific objectives required for policy and conservation management.

5. BUDGET DETAILS

The total requirement of fund is Rs 2159.73 lakhs and the component wise breakup is given in the following table.

(Rs in lakhs)

S.No.	Budget Head	All India Tiger Estimation	M-STrIPES	Tiger cell
1	Procurement of equipment (Camera traps (400 Cuddeback, 200 Reconyx), camera trap accessories (memory cards, cages), android phones - 80, GPS - 50, Sunnto compass - 50, laser range finder - 50, binoculars - 50, data storage device, laptops - 10, Work Stations - 3, Printer & accessories)	177.00	11.00	0.00
2	Field expenditures (Batteries, Base camp establishments, hostel furnishing etc)	100.00	6.00	0.00
3	Genetic analysis of scat DNA (Genetic lab chemicals, consumables, glassware, equipment)	20.00	0.00	0.00
4	Field data collection (hiring of local manpower, vehicle etc)	150.00	7.00	0.00
5	Procurement of software, remotely sensed data, attribute data purchase (FSI Maps, SGI, Meteorological, Census Directo rate, Soil, IDRISI, Statistical & Ecological Software.)	16.00	0.00	0.00
6	Spatial database cleaning, management & analysis (RS & GIS) & Software (Data entry training for forest departments, customization of shape files, online support for data entry, GIS processing)	40.00	0.00	0.00
7	Engagement of requisite manpower on contractual basis. As per the details given in the annexure	938.20	140.06	98.80
8	Publications & Printing	30.00		0.00
9	Training Workshop (WII)	25.00	3.00	0.00
10	Application Developemnt	0.00	36.00	0.00
11	Servers and Service centre for MStrIPES	0.00	143.00	0.00
12	Misc office expences	0.00	0.00	0.50
13	Contingencies	10.00	3.50	8.33
14	Total	1,506.20	349.56	107.63
15	Institutional overhead	150.62	34.96	10.76
	Grand total	1,656.82	384.52	118.39

Total budget required

2,159.73 lakhs

The objectives of the proposal fall within the provisions contained in section 5(b) (iii) of the CAF Act 2016.