

F. No. 4-1/2018-RE
MINISTRY OF ENVIRONMENT, FOREST & CLIMATE CHANGE
(RE Division)

Minutes of the Fifth Meeting of Steering Committee on R&D Scheme to consider 19 New R&D projects held on 29th November, 2018 at Indira Paryavaran Bhawan, New Delhi

1. The Fifth meeting of the Steering Committee on R&D Scheme for Conservation & Development was held on **29th November, 2018** at Indira Paryavaran Bhawan, Jor Bagh, New Delhi to consider 19 new R&D projects received from Wildlife Institute of India, Dehradun under India's National Wildlife Action Plan and submitted on-line on the MIS Portal of the new scheme on R&D Scheme on Conservation & Development. The list of participants is at **Annexure-1**. Representatives of National Tiger Conservation Authority (NTCA) and Project Elephant did not attend the meeting.

2. **Confirmation of Minutes of 4th Meeting of Steering Committee**

The minutes of the Fourth Meeting of Steering Committee held on 28.09.2018 were circulated to the committee members and were confirmed.

3. **Consideration of 19 project proposals of Wildlife Institute of India:**

Dr. T. Chandini, Advisor welcomed the members of the Steering Committee and the Experts and representative of Wildlife Division of the MoEFCC specially invited to the meeting to consider the 19 new projects received from Wildlife Institute of India, Dehradun, and listed at **Annexure-2**. It was informed that these are the first set of projects which are being considered under the new revamped Scheme on R&D for Conservation and Development.

It was informed that these projects fall within the following thematic areas of the R&D Scheme Guidelines:

- (1) Biodiversity Conservation including issues of alien and invasive species and Human-wildlife Interface.
- (2) Ecosystems Conservation & Management (Mountain, Forest, Coastal, Wetlands, Pastoral, etc) and Evaluation of Ecosystem Services.
- (3) Socio-economic issues of environment and Sustainable Development.
- (4) Conservation and Management of Landscapes and Ecologically sensitive areas including issues of sustainable livelihoods.
- (5) Sustainable Management of Natural Resources.
- (6) Climate Change: Vulnerability & Risk Assessment, Process, Mitigation and Adaptation.

The list of the 19 projects is given in **Annexure-2**.

Shri A.K. Mehta, Chairperson, Steering Committee on R&D Scheme on Conservation & Development stated that the R&D Scheme has been revamped taking into consideration that priority must be given for applied research and studies addressing environmental problems in the country. The Scheme would serve as a decision support system and outcomes of such projects and studies would help the Ministry in preparation of its policy, strategy, road-map and in the on-going schemes and programmes of the Ministry and for better enforcement of environmental regulations. The research projects considered under the Scheme must address environmental problems in the country and come up with specific solutions within a time-frame. Results from projects must start coming in at regular intervals. As an example, he stated that RET status of PAs and their ESZs should be assessed on a time-frame along with recommendations for their conservation. In this context, the 19 proposals prepared by Wildlife Institute of India as part of India's National Wildlife Action Plan 2017-2031 is a welcome step.

Dr.V.B.Mathur, Director, Wildlife Institute of India stated that the 19 new project proposals have been prepared from plan of action identified under various Chapters of **India's National Wildlife Action Plan (NWAP) (2017-2031)**, which also fall under various thematic areas of the R&D Scheme for Conservation & Development. He emphasised the need for mainstreaming projects and programmes of the National Biodiversity Action Plan, State Biodiversity Strategy and Action Plan, Natural Climate Action Plan and State Climate Action Plan with National Wildlife Action Plan and their outcome to be consolidated and synergised. He stressed the need for strengthening linkages of NWAP 2017-2031 for achieving the over arching goal of biodiversity conservation in the country. He stated that the NWAP 2017-2031 is an essential process and tool for achieving Sustaining Development Goals and Aichi Targets under the Convention of Biodiversity. He mentioned that the National Wildlife Board of India has separately approved a Recovery Programme for 21 critically endangered species. . Scattered studies/data are available that are PA specific but not on a landscape approach. He also informed that there are very few studies or data available on the status of wildlife, their habitats and ecosystems in the North-Eastern States and hence the projects have been prepared specifically for this region He informed that of the 19 proposals, 11 are PAN-India, 7 are of North-East and one is of Andaman & Nicobar Islands.

The experts invited to the meeting welcomed the proposals submitted under the National Wildlife Action Plan 2017-2031. It was stated that 40% of North-East – PAs and forest have invasive alien species which is a matter of deep concern. This is leading to migration of wild animals from their normal habitats and increased human-wildlife conflict. It was stated that internalisation of outcomes of these projects with the Forest Departments will help in addressing gaps in the implementation at field level. Director, ZSI stated that the 19 proposals are a welcome step and the objectives spelt out in the 19 proposals are very good for conservation of endangered species but would help addresses only a fraction of the enormity of the problem.

4.0 The projects were taken up for consideration as per the list at Annexure-2:

- 4.1 **“Ecological impacts of major Invasive Alien Species (IAS) on native flora and fauna in the Protected Areas (PAs) of North, Central and North-East India”.** PI of the project is Dr. Amit Kumar, Scientist – C, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Dr. B.S. Adhikari, Prof. Qamar Qureshi, Dr Navendu Page, and Dr. G.S. Rawat.

Details of the Project: The project is for a period of 3 years. The geographical location of the project is in 3 Protected Areas (PAs) in Uttarakhand (Rajaji National Park), Madhya Pradesh (Kanha National Park), Arunachal Pradesh (Pakhe National Park),

PI/Co-PI made a presentation before the Committee. It was informed that an estimated 2.6% of the geographical area of the country is covered with invasive alien species (IAS). It was stated that Prof CR Babu, Emeritus Prof and Expert has done extensive work on the invasive alien species *Lantana* which was removed very successfully from Rajaji National Park. This has been replicated successfully in different PAs. It was stated that different models of management are being practiced in different regions of the country. However comprehensive information is still lacking. The present project would study the present status of invasive alien species in 3 Tiger Reserves – Rajaji NP in Uttarakhand, Paki NP in Arunachal Pradesh and Kanha NP (MP) in Central Highlands of India. The project would involve studies on biotic pressures, soil characteristics and wildlife movement.

Objectives of the project:

- i. To study the invasion patterns of alien plants in terrestrial ecosystems of selected PAs
- ii. To assess the ecological impacts of invasive alien plant species on native flora and fauna in selected PAs
- iii. To assess the efficacy of various management practices in controlling the invasion of alien species etc.

Expected outputs of the project:

- i. Technical report highlighting the results of the study
- ii. Baseline information on the status and distribution pattern of IAS
- iii. Evidence based experimental design to curb the invasion for better management of PAs
- iv. Training of front line staff of forest department to monitor IAS

Expected outcome of the project:

- i. Patterns of diversity of IAS as well as native flora (inter-species competition).
- ii. Influence of IAS on native flora and ungulates across the invasion gradients.
- iii. Spread and patterns of invasion for conservation planning.
- iv. Mapping and management guidelines for the control of IAS

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 years	34,82,960	22,42,960	20,08,960	77,34,880

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	4574880.00
Equipment	740000.00
Consumables	500000.00
Travel Cost	1400000.00
Contingency	150000.00
Any Other	370000.00
Total Budget	77,34,880.00

The details of manpower and equipment required for the project is given below:

1 Research Associate and 3 Research Fellows (JRF/SRF), 3 Field Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name of Equipment	No of Unit
1	Camera traps	15
2	Camera SLR	3
3	Binocular	3
4	GPS	3
5	Field gear	3
6	Herbarium materials	3
7	Fencing materials for plots	3

The Committee desired to know the extent of use of successful management strategies already practiced being replicated in other regions of the country to be made as part of the study. The major causative factors for spread of Invasive Alien Species are illegal felling, and grazing. As a result, ecology of habitat is being changed leading to increased spread of invasive alien species. The dispersal of the Invasive Alien Species is due to factors such as flooding, from animal hooves, vehicle tyres. The Committee was of the view that studies on all IAS is not feasible. The study must focus and prioritise on the most abundant type of invasive alien species and extent of their distribution (area) and area specific management strategies should be prepared thereon for effective control.

The Committee after deliberations recommended the project for funding with the condition that the outcome of the study and collation of other successful cases be replicated in similar PAs with similar Invasive Alien Species and causative factors by sharing the outcome with the relevant State Forest Departments, CWLWs and Field Directors of Protected Areas. WII may prepare a time-series data on the status of Invasive Alien Species particularly where such data are available, eg Rajaji National, Park, Uttarakhand.

4.2 “Ecology and Recovery of critically endangered Vulture species in Pong Dam Protected Area (PA) and its Eco Sensitive Zone (ESZ) in Himachal Pradesh”. PI of the project is Dr. Gautam Talukdar, Scientist - E, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Ajay Srivastava, K. Sivakumar, Suresh Kumar and Dr Anju Baroth.

Details of the Project: The project is for a period of 3 years. The geographical location of the project is the protected area of Pong Dam and its ESZ in Kangra in the State of Himachal Pradesh.

PI/Co-PI made a presentation before the committee.

Objectives of the Project:

1. Ecological monitoring by extensive field survey and satellite telemetry of the vultures.
2. Identification of Vulture safe zones.
3. Capacity building of forest department for long-term conservation of Vultures by mainstreaming it in the conservation plan of the PA and in the Zonal Management Plans of Eco-sensitive Zone of the Pong Dam PA.

Expected outputs of the project:

- i. Mapping of Vulture Safe Zones in Himachal Pradesh for re- introduction of captive-bred vultures
- ii. A long-term conservation plan for critically endangered vultures in HP.
- iii. Current status and distribution patterns of vultures populations in Himachal Pradesh and its linkages with Eco-Sensitive Zones
- iv. Database on habitat requirements and movement patterns of vultures in Himachal Pradesh
- v. A long-term conservation plan for critically endangered vultures in Himachal Pradesh.

Expected outcome of the project:

- i. Guidelines for the development of Zonal Management Plan of Eco-Sensitive Zones
- ii. Long-term conservation of vultures and restoration of Eco Sensitive Zones in Kangra District, Himachal Pradesh

He stated that 8 of the 9 endangered vulture species are of *Gyps* genus. The species of vultures that are to be studied under the project are the following:

- White backed Vulture (*Gyps bengalensis*)
- Indian Vulture (*Gyps indicus*)
- Red-Headed Vulture (*Sarcogyps calvus*).
- Egyptian Vulture (*Neophron percnoptens*)

He informed that the Bombay Natural History Society (BNHS) has done extensive work on impacts of Diclofenac on the decimation of vulture population and on Diclofenac residues in ecosystems. The Diclofenac prevalence would be studied in Pong Dam which is a PA in Himachal Pradesh and on that basis as studies have not been carried out for this PA and its ESZ. The PA would be demarcated as ‘safe’ and ‘unsafe’ zones. Vultures would be reintroduced. A Capacity Building and Awareness programme will also be undertaken as

part of the project on the impacts of use of drugs/intentional killing of wildlife/poisoning of carcass due to increased human-animal conflicts, etc.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 Years	32,28,000	32,78,000	20,19,760	85,25,760

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	1805760.00
Equipment	2200000.00
Consumable Cost - Chemicals	9,00,000.00
Travel Cost	15,00,000
Contingency	8,70,000
Any Other - Acquisition of satellite data	12,50,000
TOTAL	85,25,760.00

The details of manpower and equipment required for the project is given below:

1 Research Fellow (JRF/SRF), 1 Research Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name of Equipment	No of Unit
1	Binocular	3
2	GPS	2
3	Rangefinder	2
4	Camera	2
5	PTT Transmitter (Consumable)	10

The Committee stated that it may be difficult to categorise areas as safe and unsafe as the vultures are found wherever carcasses are found. However the objectives and expected outcome could help in the revival of the critically endangered vulture species in this region. The Committee after deliberations recommended the proposal for funding.

- 4.3 **“Assessing effects of linear infrastructure on wildlife: Landscape level characterization and spatial prioritization for impact mitigation”**. PI of the project is Dr. Malvika Onial, Scientist – D, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Dr Bivash Pandav, Dr Bilal Habib, Dr Sutirtha Dutta, Dr Vishnupriya Kolipakam, Dr R Suresh Kumar, Dr YV Jhala and Prof Qamar Qureshi.

Details of the Project: The project is for a period of 3 years. The geographical location of the project is in the States of Uttarakhand, Uttar Pradesh, Madhya Pradesh, Maharashtra, West Bengal and Assam.

PI/Co-PI made a presentation before the committee.

Objectives of the project:

- i. Mapping linear infrastructure (roads, rail, power-line, canals) at a pan-India level at the interface of wildlife habitats, with emphasis on elephant and tiger landscapes
- ii. Understanding the effects of fragmentation by linear infrastructure on genetic connectivity of ecologically representative species
- iii. Identifying and prioritizing areas for mitigation measures to reduce animal mortalities due to roads and railway in tiger and elephant landscapes etc.

It was stated that impacts of development by using parameters such as increase in night lights and GIS mapping of built up/construction in areas would also be studied along with linear infrastructure projects.

Expected outputs of the project:

- i. Spatial database of linear infrastructure with respect to wildlife habitats will be generated.
- ii. Determination of threshold of connectivity required to sustain long-term persistence based on optimum patch sizes and connectivity parameters, and Identification of patch characteristics and their respective mitigation measures.
- iii. Priority mapping of high vulnerability areas for planning mitigation measures for linear infrastructure particularly for tiger, elephant and threatened bird species.

Expected outcome of the project:

- i. The spatial databases and maps generated by this project will provide the MoEFCC with a robust base for providing technical advice and improved sectoral coordination with concerned development agencies.
- ii. The project will highlight the impacts of linear infrastructure on fragmentation of habitats and populations as well as prioritize areas for impact mitigation. Thus, the project aligns with NWAP objectives and required actions related to landscape level approach for wildlife conservation and strengthening of PA network.
- iii. By assessing the distribution of invasive species with respect to linear infrastructure, particularly road development, the project will contribute to the NWAP objective of formulating invasive and alien species management plan in PAs as well as contribute to NBT 4 and Aichi Target 9.
- iv. By identifying areas of high collision risk of endangered species such as elephants, tiger and threatened birds, the project will contribute to the NWAP objective of conservation of threatened species as well as NBT 6 and Aichi Target 12.
- v. Outputs on genetic connectivity across a gradient of patch characteristics and identification of threshold fragmentation to enable gene flow will help in formulating landscape level plans for wildlife conservation that seeks to maintain genetic connectivity for long-term persistence of populations, as emphasised in NWAP.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 years	44,24,000	37,85,000	35,45,000	1,17,54,000

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	43,69,000.00
Equipment	38,60,00.00
Consumables – Genetic Analyses	Rs 15,00,000
- Chemicals	Rs 8,35,000 = 29,35,000.00
- Batteries, field supplies, etc	Rs 6,00,000
Travel Cost	26,10,000.00
Contingency	2,14,000.00
Any Other – Field accommodation @1.8 lakhs/yr at prevalent rates	5,40,000.00
- Spatial Data base	+ 6,00,000 = 12,40,000
- Publication	+ 1,00,000
Total Budget	1,17,54,000.00

The details of manpower and equipment required for the project is given below:

1 Research Fellows (JRF/SRF), 1 Research Associate, 2 Research Assistants and 1 Field Assistant are required for the project. Details of equipment required under the project are given below:

S.N.	Name of Equipment	No of Unit
1	Freezer	1
2	Computers	2
3	Binoculars	4
4	GPS	4

The Committee stated that this is an important project and recommended for funding.

4.4 “Inventorisation and Assessment of RET Species in select Protected Areas and their Eco- sensitive Zones of India”. PI is Dr. K. Sivakumar, Scientist - F, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand.

Details of the Project: The project is for a period of 2 Years 6 Months. This is a PAN-India project covering 6 regions of the country. The geographical location of the project is Dehradun in the State of Uttarakhand.

PI/Co-PI made a presentation before the committee. The project will include both field and deskwork. An inventory of RET species in select PAS and their ESZs through existing literature. An assessment of RET species in select PAs and their ESZ will be conducted, and their monitoring protocol will be developed. A geodata base for the PAs and their ESZs will also be prepared. WII on the basis of advice of the Committee replaced two PAs, namely Keoladeo National Park and Ranganthitu Bird Sanctuary with two other PAs - Sariska National Park and Bandipur National Park. The scope of the project was also changed to include PAs in addition to ESZs.

The study area of the project includes twelve PAs and their ESZs from 6 regions of the country as given below:

- 1) East – i) Jaldapara National Park, ii) Bhitarkanika National Park.
- 2) West – i) Sariska National Park, ii) Velavedar Black Buck National Park.
- 3) North-East- i) Keibul Lamjao National Park, ii) Khangchendzonga National Park.
- 4) Central – i) Pench Tiger Reserve, ii) Bandhavgarh Tiger Reserve.
- 5) North- i) Nanda Devi National Park, ii) Great Himalayan National Park.
- 6) South- i) Periyar Tiger Reserve, ii) Bandipur National Park.

Objectives of the project:

- i. Building the knowledge-base for existing RET species within select PAs and their ESZs of India from literature reviews.
- ii. Inventory and Assessment of RET Species in select ESZs.
- iii. Mapping of LULC of Eco-sensitive Zones and maintaining a geo-database of select ESZs.

Expected outputs of the project:

- (i) Data / Knowledge-base for RET species existing within select ESZs
- (ii) Geo-database of select PAs and their ESZs
- (iii) Technical report on inventory and assessment of RET species

Expected outcome of the project: Based on the data collected on status, habitat preference and prevalent threats of the RET species, recommendations for management and planning will flow into the ZMPs of ESZs.

It was stated that spatial mapping of Invasive Alien Species (IAS) would also be carried out and the impacts of Linear Infrastructure on the increase/distribution of IAS in the regions of study. Specific recommendations for management and planning will be part of the study for integration in the management of PAs and the Zonal Management Plans of ESZs.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
2 Years 6 Months	88,88,000	56,88,00	38,59,280	1,84,35,280

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	71,45,280
Equipment	31,00,000
Consumable Cost	9,00,000
Travel Cost	41,40,000
Contingency	31,50,000
Any Other	0.00
Total Budget	1,84,35,280

The details of manpower and equipment required for the project is given below:

Manpower – Nil

Details of equipment required under the project are given below:

S. N.	Name	No of Unit
1	Binocular	6
2	GPS	6
3	Range Finder	6
4	Drone with accessories	1
5	Computer	2
6	Camera Trap	50

The Committee noted that there are a total of 764 PAs. Inventorisation and assessment of the biodiversity of the PAs and their ESZs is a very major exercise and the present project is only a beginning in this effort. The Committee was of the view that merely assessing the biodiversity in ESZs without assessing the status in the PAs would not be very beneficial for preparation of a conservation and management plan and hence the scope of the study be modified to include PAs of these ESZs. The Committee desired that the two PAs, namely Keoladeo National Park and Ranganthitu Bird Sanctuary be replaced with two other PAs. WII agreed by replacing them with Sariska National Park and Bandipur National Park. The Committee stated that the study would help understand the RET status and could help in developing time-series data on the biodiversity value of these PAs and their ESZs. The Study should also bring out the value of establishing an ESZ around the PAs as a buffer zone. The impacts of developmental activities – Prohibited, Restricted and Permitted as notified in ESZ Notifications on the biodiversity in ESZs and recommended that this should be included as part of the study. After deliberations, the committee recommended the project for funding subject to these conditions.

- 4.5 **“Implementation of Monitoring System for Tigers - Intensive Protection and Ecological Status (MSTripES) in representative Protected Areas in India”** PI: Dr. Y. V. Jhala, Scientist – G, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PI of the project is Dr. Qamar Qureshi.

Details of the Project: The project is a PAN-India project for a period of 2 years. The geographical locations of the project are Sheopur, Madhya Pradesh, Goa, Kerala, Andhra Pradesh, Gujarat, West Bengal, Uttarakhand, Jammu & Kashmir.

PI/Co-PI made a presentation before the Committee. It was informed that one PA from each State would be selected for the study. It was stated that the scope/objectives of the present study have not been tried in most Tiger Reserves of the country. Monitoring programmes such as the present project would help answer/address many issues relating to more effective management of PAs. In addition to the present project, another project of similar scope has been taken up in the N-E region since the problems, issues and management practices would be different. The ecosystem monitoring and capacity building would accordingly be different for the two regions under the two projects.

Objectives of the project:

- i. Use Information, Digital, GPS, GPRS, and GIS Technology along with Artificial Intelligence to design and implement smart patrolling system for PAs,
- ii. Use modern scientific tools and techniques for population assessment and monitoring of a) major fauna, b) habitat condition, and c) human impacts on the PAs.
- iii. Map and evaluate the extent and trends in human-wildlife conflict with an aim to assist in their mitigation
- iv. Use the above information to generate informative reports that are readily available to managers and policy makers for adaptive management.
- v. Impart training to frontline staff for effective patrolling for law enforcement, ecological monitoring and conflict data recording

Expected outputs of the project:

- i. Well trained frontline staff providing better surveillance
- ii. The database generated through this project will facilitate the park managers to develop management plan
- iii. Establishment of basic infrastructure for future monitoring

Expected outcome of the project:

- i. Strengthening of PA management and law enforcement
- ii. Establishment of a system for long term monitoring
- iii. Baseline information for managers
- iv. Quantitative method for protected area management and performance evaluation

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Total Budget (in Rs.)
2 years	94,90,080	53,34,192	1,48,24,272

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	46,08,000.00
Equipment	47,25,600.00
Consumables	0.00
Travel Cost - @ Rs 20,00,000 for 8 PAs for 2 years	20,00,000
- Vehicle Hiring at prevalent rates for 6months/yr	24,00,000 = 44,00,000.00
Contingency	2,90,672.00
Any Other 8 Workshops @ 1 workshop/PA @ Rs 1,00,000 Publications + resource Material, etc	8,60,000
Total Budget	1,48,24,272.00

The details of manpower and equipment required for the project is given below:

4 Research Fellows (JRF/SRF), and 8 Field Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name of Equipment	No of Unit
1	Mobile Phones	250
2	Computers	20
3	GPS	8
4	Rangefinders	26
5	Sunnto Compass	26

The Committee noted that two similar projects on MSTriPES from WII, one from NE and the second from other geographical regions of the country are before the Committee for consideration as PAN-India projects. It was also noted that both these represent widely varied scenarios as they are looking at two different regions of the country – the first from Central India and the second from North-Eastern region (at S.No. 4.16). Since the geographic characteristics, landscape, issues and problems are quite different; the Committee after deliberations recommended that both projects could be taken up for funding. The Committee however stated that the following issues/conditions should be followed by WII for both projects:

- Project integration with data already collected.
- Mobile Apps from different projects should be integrated at least on desk top for data analyses and more effective management.

The Committee desired that the project outcomes must be shared with the NTCA, CWLWs of the State Forest Departments for integration of the outcomes with their on-going programme for better conservation of the Tiger Reserves in these States.

- 4.6 **“A landscape-level assessment of elephant occupancy, habitat connectivity, genetic composition and human-elephant conflicts across Terai-Arc landscape for population management and conflict mitigation”.** PI of the project is Dr. Bivash Pandav, Scientist - F, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Dr. Samrat Mondol, Scientist D and Dr. Parag Nigam, Scientist F.

Details of the Project: The project is for a period of 3 years. The geographical location of the project is Laldhang, Haridwar in the State of Uttarakhand, Uttar Pradesh and Bihar.

PI made a presentation before the committee. It was stated that there are isolated studies done on specific PAs such as Rajaji National Park however large areas on a landscape approach covering three States has not been done. The present project has been prepared on a landscape approach. Regular elephant census is being carried out.

Objectives of the project:

- i. Patterns of occupancy and habitat connectivity at the landscape scale (a) To assess overall occupancy of elephants in TAL and identify ecological and management factors that governs such patterns of landscape-level occupancy (b) To assess patterns and extent of habitat connectivity for the elephants in the landscape using the least-cost path framework.
- ii. Evaluate and map the status of elephant habitat and threats (a) To use elephant distribution data derived from occupancy modelling for identifying and mapping elephant habitat (b) To generate fine-scale information on habitat status and anthropogenic pressures.
- iii. Landscape-level genetic connectivity between elephant sub-populations (a) To assess the genetic connectivity between elephant sub-populations using molecular tools.
- iv. Home range, dispersal, habitat use and demography of elephant populations inside protected area (a) To understand elephant ranging and movement patterns, habitat use through radio collaring selected animals in Rajaji National Park (b) To predict future trends of elephant populations based on age- structure analysis using population growth models.
- v. Assessment of human–elephant conflict in the landscape (a) To understand the spatial patterns of human–elephant conflict across the landscape and assess if certain sites are predisposed to relatively high levels of conflict etc.

Expected outputs of the project:

- i. Landscape scale distribution map with high and low probability of elephant occurrence.
- ii. Approximate population size and demographic status of elephants in PAs with specific recommendations.
- iii. Genetic composition, possible population structure, relatedness and gene flow among elephant populations.
- iv. Detailed information on spatial extent of conflict.

Expected outcome of the project:

- i. Major outcome will be the most detailed information on elephant occupancy, habitat status, behaviour, ranging pattern, genetics and threats. Another critical outcome is mapping of human-elephant conflict incidents and quantify the losses.
- ii. Develop Management Strategy and conflict monitoring protocol including suggesting specific measures/recommendations for respective departments of the States and Specific measures/recommendations for Habitat Restoration.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 Years	38,77,760	22,01,760	17,43,520	78,23,040

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	30,23,040.00
Equipment	12,00,000.00
Consumables –	
- Chemicals @ Rs 6,00,000	
- Satellite data acquisition for 6 Radio Collars @ Rs 10,00,000	18,00,000.00
- Immobilisation drugs and cost for capturing the elephants	
Travel Cost	12,00,000.00
Contingency	6,00,000.00
Any Other	0.00
Total Budget	78,23,040.00

The details of manpower and equipment required for the project is given below:

2 Research Fellow (JRF/SRF), 2 Field Assistants and 15 Local Field Assistants are required for the project. Details of equipment required under the project are given below:

Sr.No.	Name	No. of Unit
1	Radio collar	6

The Committee noted that several studies are available on various aspects of elephant populations. The Committee particularly referred to a study undertaken by Vivek Menon Group on preparation of elephant corridor maps for the country. In addition, it was stated that the Department of Biotechnology has recently funded a all-India project to Dr.Sukumar of Indian Institute of Science (IISc), Bangalore for studying the genome composition of

elephant in the country. The Committee noted that this project must come up with specific recommendations on the best management strategy which is most effective in addressing human-elephant conflict across the Terai-Arc Landscape. The study should help in predicting where conflicts could occur and specific measures for minimising such conflicts. After deliberations, the committee recommended the project for funding subject to these conditions.

- 4.7 **“Ecology of selected High-Altitude wetlands in two biodiversity hotspots of India for developing Conservation and Management Plans”**. PI of the project is J.A. Johnson, Scientist, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the projects are Dr. Gopi G.V., Dr. K.Sivakumar and Dr. S. A. Hussain.

Details of the Project: The project is for a period of 3 years.

PI/Co-PI made a presentation before the committee. Three high-Altitude wetlands each from the Himalayas and from the Western Ghats have been selected under the project. The geographical locations of the project are 3 High-Altitude wetlands - Todi Tal, Taruk Tal and Tehri Dam in the Central Himalayas in the State of Uttarakhand and 3 from the Western Ghats – Idukki in Kerala, Avalanche and Ooty Lake in the Nilgiris, Tamil Nadu. These include artificial wetlands (Tehri Dam and Ooty Lake). He stated that the biodiversity assessment would be limited to fish and birds of these wetlands.

Objectives of the project:

- i. Study the limnology of select wetlands of India including levels of pollutants and sources and extent of pollution and in addition, the hydrology of the lakes.
- ii. Understand the wetland functions (process) including nutrient status, productivity and carbon sequestration of selected wetlands.
- iii. Document biodiversity and ecological settings of selected wetland and evaluate ecological impacts (positive negative) of human-made wetlands and its ecological services.
- iv. Demonstrate wetland-monitoring protocol developed by Wildlife Institute of India and develop a framework for preparing management plan for wetlands located at mountains.
- v. Preparation of a Management Plan for the 6 sites @ Rs 3 lakhs/site.

Expected outputs of the project:

- i. Ecological process of coldwater and human made wetlands will be generated
- ii. Positive and negative impacts and ecosystem services provided by human made wetlands will be produced
- iii. As a pilot study, demonstration of wetland monitoring protocol will be done
- iv. Conservation and Management Plan for selected wetlands will be prepared

Expected outcome of the project:

- i. The output generated through this project will facilitate the State Government to develop management plan for wetlands
- ii. The information on positive and negative impacts of human made wetlands will provide decision supporting system for guiding developmental projects.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 Years	32,46,500	16,76,500	13,32,520	62,55,520

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	21,71,520.00
Equipment	1,50,0000.00
Consumable Cost	5,00,000.00
Travel Cost	1,33,4000.00
Contingency	2,50,000.00
Any Other – Establishment and Maintenance of 2 Base Camps (1 in Himalayas and 1 in Western Ghats)	5,00,000.00
Total Budget	62,55,520.00

The details of manpower and equipment required for the project is given below:

2 Research Fellow (JRF/SRF) are required for the project. Details of equipment required under the [project are given below:

S. N.	Name of Equipment	No of Units
1	YSI Multi-probe water testing kit	2
2	Field Camera	2
3	Field gears (GPS, Compass, Binocular, Rangefinder, plankton samplers, benthic sampler, fishing nets) 2 nos in each	2

The Committee desired that the word “High-Altitude” should be included for the wetlands under study. The Committee was of the view that the pollutant status of the lakes must also be ascertained including sources and extent of pollution. In addition, the hydrology of the lakes must also be studied for a comprehensive study of the lakes. The Committee agreed for an additional Outcome: Preparation of a Management Plan for the 6 sites @ Rs 3 lakhs/site subject to these additional studies. The Committee after deliberations recommended the project for funding subject to these conditions.

4.8 “Evaluating the ecosystem services of mangroves and sea-grasses in Andaman and Nicobar islands with special reference to climate change”. PI of the project is Dr.Nehru P, Scientist, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Dr. K. Sivakumar and Dr. Alok saxena.

Details of the Project: The project is for a period of 3 years. The geographical location of the project is Port Blair, South Andamans in Andaman and Nicobar Islands.

PI/Co-PI made a presentation before the committee.

Objectives of the project:

- i. To understand the ecosystem services of mangrove and seagrass ecosystems in
- ii. Mapping various ecosystem services of mangroves and seagrasses
- iii. Prioritization and economic evaluation of important ecosystem services including tourism
- iv. Assessing the impact of climate change on the mangroves, seagrasses and their key ecosystem services
- v. Develop a conservation plan for sustainable management of mangroves and seagrasses in Andaman Nicobar Islands

It was stated that the impacts of climate change has been included in the study as the IPCC Report has particularly mentioned there is an increase in sea level rise in the Indo-Pacific Region; and as a result mangroves will shift towards the sea. The extent and implications of this requires to be studied. Further, the tectonic shift due to the 2004 Tsunami has also some role. No quantitative information is available.

Expected outputs of the project:

- i. Site specific management plan for the target ecosystem services
- ii. Long-term monitoring and estimation of the rate of annual sea level rise in Andaman and Nicobar Islands
- iii. Management plan for the seagrass and mangrove ecosystems to mitigate sea level rise impacts
- iv. One PhD and Minimum 2 MSc dissertations
- v. 3-5 publications in peer reviewed journals

Expected outcome of the project:

- i. The management plan developed with the help of the project will serve as a baseline material for the forest and tourism departments to align their efforts for the sustainable management of mangrove and seagrass ecosystems under sea level rise threat.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 Years	34,46,376	21,00,996	23,47,591	78,94,963

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	32,36,160.00
Equipment	10,49,000.00
Consumables	345,000.00
Travel Cost	19,05,000.00
Contingency	1,54,803.00
- Any Other Base Camp Maintenance @ Rs 2,55,000	12,05,000.00
- 3 Stakeholder meetings @ 2.5 lakhs/workshop (more expensive due to isolated nature of the region)	
- Publication @Rs 2,00,000	
Total Budget	78,94,963.00

The details of manpower and equipment required for the project is given below:

1 Research Fellow (JRF/SRF), 1 Research Associate and 2 Field Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name of Equipment	No of Unit
1	Rod surface elevation table (9) and receiver (1)	10
2	GPS	2
3	Multiparameter meter	1
4	Soil core collection unit	1
5	Camera	1
6	Field gears	2
7	Laptops	2

The Committee noted that mangroves and sea-grass are two entirely different types of ecosystems – mangroves in coastal while sea-grass is marine ecosystem; while mangroves have been studied extensively, sea-grass ecosystems less so. Further, a large number of detailed studies have been already done on mangroves of the country by institutions such as Annamalai University, Dr.M.S.Swaminathan Research Foundation, etc. Very detailed study including ecosystem services of mangroves has also been carried out on the mangroves of Sunderbans, West Bengal. The Committee after deliberations was of the view that the WII must ensure that study covers aspects or regions of A&N Islands not studied by any institutions in the country to avoid overlapping/duplication of work and further, findings of other studied must be examined and collated with the present study. However, the study is important and hence subject to these conditions, the project is recommended for funding by the Ministry under the Scheme.

4.9 **“Conservation planning based on ecology of the endangered Lesser Florican and assessment of provisioning services in multiple-use semiarid landscapes”**

PI: Dr.Sutirtha Dutta, Scientist – D, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Dr. Y. V. Jhala, Dr. K. Sivakmar, Mr. Qamar Qureshi, Dr. Vishnupriya Kolipakam, Dr. Navendu Page, Dr. Lallianpui Kawlani, Dr. G. S. Bhardwaj (ext) and Mr. Devesh Gadhvi (ext).

Details of the Project: The project is for a period of 3 years. The geographical location of the project is Nasirabad, Ajmer in the State of Rajasthan and Bhavnagar, Gujarat.

PI made a presentation before the committee. It was informed that 70% of the Lesser Florican is found in the States of Rajasthan and Gujarat and the remaining 30% in the rest of India. A total of 340 male territories have been identified. There is a pressure on their habitats as more and more grasslands are being converted into agricultural land. A Guidelines was brought out by MoEFCC in 2013 for conservation of Lesser Florican. Studies have been carried out by WII and BNHS, State Forest Dept, etc but site-specific data and on impacts and conservation plans are not available and hence Site specific conservation Plans are required.

Objectives of the project:

- i. Comprehensive understanding of seasonal space use by Lesser Florican and responses to changing land-uses and climate.
- ii. Understanding the status and impact of habitat degrading agents on Lesser Florican, associated species, and pastoral livelihoods with emphasis on the invasive *Prosopis*.
- iii. Developing strategic roadmap for grassland management aimed at Lesser Florican conservation etc.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1 st Year (in Rs.)	Budget 2 nd Year (in Rs.)	Budget 3 rd Year (in Rs.)	Total Budget (in Rs.)
2 years 9 Month	46,61,000	23,51,000	10,63,000	80,75,000

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	18,96,000.00
Equipment	17,10,000.00
Consumables	3,95,000.00
Travel Cost	23,56,000.00
Contingency	1,58,000.00
Any Other -Field Accommodation = 5.6 lakhs - Workshops – Rs 5 lakhs	15,60,000.00

- Imagery & Mapping = Rs 4 lakhs - Publication = Rs 1 lakh	
Total Budget	80,75,000.00

The details of manpower and equipment required for the project is given below:

1 Research Fellows (JRF/SRF), 1 Research Assistants, 2 Field and Lab Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name	No of Unit
1	Solar GSM radio tags	7
2	Laptop	2
3	Storage device (Hard disk)	3
4	Spotting scope	1
5	Acoustic detector (Songmeter)	8

Expected outputs of the project:

- i. Comprehensive understanding on habitat requirements of Lesser Florican and identification of (in)compatible land-uses
- ii. Pilot testing of remote monitoring tool and annual estimates of Lesser Florican abundance from high-priority sites
- iii. Understanding on behavioral responses of Lesser Florican to agricultural landscapes and to climate change induced rainfall anomalies
- iv. Pilot baseline information on disease prevalence and population genetic structure to inform ex-situ and in-situ management
- v. Status and trend of land-uses in Lesser Florican habitats and their likely effects on the species persistence
- vi. Assessment of provisioning ecosystem services (fodder and fuel) to local livelihoods in Lesser Florican habitats
- vii. Impact of *Prosopis* invasion on biodiversity and livelihoods of semiarid agro-grassland ecosystem and feasibility plan of *Prosopis* eradication
- viii. Spatial prioritization for conservation/restoration of Lesser Florican habitats
- ix. Conservation management strategy plan for the endangered Lesser Florican and semiarid agro-grassland ecosystem.

Expected outcome of the project:

- i. Facilitate State Governments to develop and implement recovery plans for the Lesser Florican, thereby aiding in conservation of a threatened species (NWAP chapter 3)
- ii. All outputs, especially the conservation management strategy plan (output ix), will aide in initiating and implementing species recovery plans for priority RET species towards a landscape level approach for wildlife conservation (priority objective 2.4 under chapter 2)
- iii. By assessing the status and impacts of invasive, alien *Prosopis juliflora* on biodiversity and livelihoods in Florican habitats that includes PAs, the project will aide in strengthening and improving PA network (NWAP chapter 1) and in developing

management plan to protect native biodiversity and livelihoods from invasive species (NWAP chapter 2)

- iv. By generating spatial prioritization map for conservation/restoration of Lesser Florican habitats, the project (output viii) will align with identification of important wildlife habitats outside the administrative control of SFDs (NWAP priority project under chapter 1)
- v. By generating pilot baseline information on disease prevalence in Lesser Florican (output iv), the project will aid in strengthening research and monitoring (priority project 2.4 under NWAP chapter 14) etc.

The Committee noted that a number of earlier studies are already available on the conservation/population census of the Lesser Florican. The present study must not cover the aspects/regions on which information is already available to avoid overlapping/duplication of work. The Committee noted that outcomes to be generated from the study are important and after deliberations, the Committee recommended the project for funding.

- 4.10 **“Assessing fine scale distribution pattern, population and habitat status of northern Swamp Deer (*Rucervus duvauceli duvauceli*) across upper Gangetic Plains of north India”**. PI of the project is Dr. Samrat Mondol, Scientist - D, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Dr. Bivash Pandav, Scientist F, Dr. Parag Nigam, Scientist F, Dr. Bilal Habib, Scientist E and Dr. Navendu Page, Scientist C.

Details of the Project: The project is for a period of 3 years. The geographical location of the project is Bijnor in the State of Uttar Pradesh and Uttarakhand.

PI/Co-PI made a presentation before the committee. It was stated that the Swamp Deer (*Rucervus duvauceli duvauceli*) is a very endangered species in the agriculture-forest landscape of the country and urgent measures are required for its conservation otherwise it is possible that we may lose the species altogether. Specific conservation plans are required to be prepared and implemented by the concerned States on priority.

Objectives of the project:

- i. Assessing fine-scale distribution of swamp deer across its habitat in Uttarakhand and Uttar Pradesh through intensive ecological surveys.
- ii. Mapping the distribution of grassland patches with swamp deer evidences along upper Ganga and its tributaries, along with evaluation of extent of grassland usage by wildlife and identify suitable sites for grassland restoration.
- iii. Understanding swamp deer movement patterns by radio collaring selected male and female animals in the Jhilmil Jheel Conservation Reserve and Banganga wetland area.
- iv. Evaluating genetic composition of the northern swamp deer species using biological samples collected during field surveys.
- v. Estimating genetic relatedness, population structure, dispersal direction and rates, and evaluating inbreeding status of existing swamp deer populations etc.

Expected outputs of the project:

- i. Fine-scale data of swamp deer occurrences.
- ii. Detailed mapping and selection of critical habitats for restoration.
- iii. Information on swamp deer behaviour and habitat use.
- iv. Assessment of minimum number of individuals in each population, possible population structure, relatedness and inbreeding status.

Expected outcome of the project:

- i. Major outcome will be the most detailed information on northern Swamp deer distribution, habitat use and threats.
- ii. Another critical outcome is identification of critical grassland patches for restoration.
- iii. The genetic data will be useful in selecting individuals from populations for reintroduction in suitable areas, whenever required.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 Years	3563000	1687000	1428760	66,78,760

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	22,53,760.00
Equipment	7,00,000.00
Consumables	13,25,000.00
Travel Cost	11,00,000.00
Contingency	5,00,000.00
Any Other (Satellite and Data Acquisition = 8,00,000)	8,00,000.00
Total	66,78,760.00

The details of manpower and equipment required for the project is given below:

1 Research Fellow (JRF/SRF), 2 Field Assistants and 20 Local manpower during swamp deer collaring operations are required for the project. Details of equipment required under the project are given below:

S.N.	Name	No of Unit
1	GPS radio collars	4

The Committee stated that the specific outcomes of the Report of the project must be taken up with the concerned State Forest and Agriculture Department for implementation of an action plan. The Committee after deliberations recommended the project for funding.

4.11 **“Ecological Implications of Plastic consumption and Plastic waste generated from various sectors in India in the context of Coastal and Marine Ecosystems in all Coastal States of India”**. PI of the project is Anju Baroth, Scientist – C, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Gautam Talukdar and K. Sivakumar.

Details of the Project: The project is for a period of 3 years. The geographical location of the project covers the States of Tamil Nadu, Andhra Pradesh, West Bengal, Gujarat, Maharashtra, Odisha, Kerala, Karnataka.

PI made a presentation before the committee. It was informed that the National Geographic Society is partnering with WII to examine the use and migration of plastics from source to the sea. The present project would combine a Desk study involving collection of secondary data on plastics and specifically field studies on the impacts of plastics on coastal and marine ecosystems of all the coastal States in the country.

Objectives of the project:

- i. Quantifying the plastic consumption and waste generation across three major sectors (Packaging, Automotive and Electronics) in India.
- ii. Identifying environmental and ecological impacts from three major sectors (Packaging, Automotive and Electronics) in coastal and marine ecosystems in India.
- iii. Assess the plastic-related Natural Capital Cost (NCC) and NCC intensity of each sector.
- iv. Mapping the plastic supply chain upstream and downstream from raw material extraction, manufacturing and use to the end of its life in the coastal and marine ecosystems in India.

Expected outputs of the project:

- i. First time valuation of Natural capital cost of three major sectors from plastic industry in India.
- ii. Baseline data on most plastic intensive and most plastic waste generating sector in India
- iii. First time assessment of the most significant ecological impacts from plastic sector in India
- iv. First time sectorwise quantification of plastic waste from India that is ending up as marine litter and damaging the coastal and marine ecosystem.
- v. First time quantification of stress on water resources due to plastic sector in India

- vi. First time sector wise Life Cycle Analysis of plastics from plastic industry of India reaching the coastal and marine ecosystem to assess the upstream and downstream stages across sectors for mapping the environmental damages.
- vii. Baseline data on the state of environmental disclosure by plastic companies in India etc.

Expected outcome of the project:

- i. The study will be helpful for state governments to identify the sector with highest natural capital cost in their state and work towards creating green cities by enforcing stringent regulation and proposing “Natural Capital Cost Tax”.
- ii. The study will help in India s commitment to Convention on Biodiversity by strengthening on Green economy initiative where business and industry as appropriate and in accordance with national legislation are invited to contribute to sustainable development and to develop sustainability strategies that integrate, inter alia, green economy policies.
- iii. The study will help companies and other stakeholders support the development of new enforceable standards to reach the Rio+20 goal of “achieving significant reduction in marine debris to prevent harm to coastal and marine environments.
- iv. The output will help frame stringent regulations for the most plastic intensive sector and push those sectors to identify more sustainable alternative materials having low NCC, so that the damage to the ecosystems could be minimised.
- v. The outputs generated through this study will help MoEFCC identify most ecological damaging sector among the plastic industry and can ensure compliance from these sectors under Plastic Waste Management Rule, 2016 etc.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 years	2,76,118	20,63,738	32,58,778	80,83,634

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	2616960.00
Equipment	170000.00
Consumable Cost	1820000.00
Travel Cost	700000.00
Contingency	127939.00
Any Other – Base Camp Accommodation and Publication + International Workshop	640000.00 + 10,00,000
Total Budget	80,83,634.00

The details of manpower and equipment required for the project is given below:

1 Research Fellows (JRF/SRF), 1 Research Associate, 1 MTS are required for the project. Details of equipment required under the project are as follows:

S.N.	Name of Equipment	No of Unit
1	LCA Software	1

The Committee was of the view that this is an important project but the scope of the study should be focussed to obtain outputs and outcome which directly relate to ecological pathways and impacts of plastics into the coastal and marine ecosystems. The Committee therefore revised the topic from “Assessing the Natural Capital Cost of use of Plastics and the Ecological Implications of Plastic Waste Generation from various sectors including Forest Sectors in India” to “Ecological Implications of Plastic consumption and Plastic waste generated from various sectors in India in the context of Coastal and Marine Ecosystems in all Coastal States of India”. The Committee desired that institutions such as the National Centre for Sustainable Coastal Management (NCSCM), Chennai and the National Coastal Zone Management Authority (NCZMA) could be involved/consulted and outcomes of the Project shared for preparation of specific Action Plan in consultation with State Governments. The Committee recommended for funding subject to these conditions.

- 4.12 **“A study the effectiveness of relocation and rehabilitation of programmes of communities from PAs and TRs”**. PI is Dr. Ruchi Badola, Scientist – G, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the projects are Anil Kumar Bhardwaj, S.A. Hussain, Pariva Dobriyal and Hemelata Khanduri

Details of the Project: The project is for a period of not given. The geographical location of the project is in the States of Uttarakhand, Madhya Pradesh and Karnataka.

PI/Co-PI made a presentation before the committee. It was stated that one PA from each 3 States – Rajaji NP (Uttarakhand), Satpura NP (M.P) and Nagarhole NP (Karnataka) have been selected under the project.

Objectives of the project:

- i. To document and examine the processes and strategies adopted for relocation and rehabilitation of communities from representative PAs/ TRs.
- ii. To assess the impacts of these programmes on the PAs/TRs and livelihoods of local communities.
- iii. To critically examine the factors responsible for the success or failure of these programmes.
- iv. To document important case studies and suggest strategies which could strengthen future relocation/ rehabilitation programmes around PAs/TRs, in the light of lessons learnt from objectives 1, 2 and 3.
- v. To design capacity building programmes for key stakeholders for effective planning and implementation of relocation/ rehabilitation from PAs/TRs.

Expected outputs of the project:

- i. An account of processes and strategies adopted for relocation and rehabilitation from PAs/TRs.
- ii. Assessment of impacts on PAs/TRs and sustainable livelihoods of local communities.
- iii. Understanding of various factors that are critical as drivers for success or failure of the relocation and rehabilitation programmes etc.

Expected outcome of the project:

- i. Improved understanding of relocation and rehabilitation programmes for PAs and better efficacy of future programmes.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 years	28,09,300	23,82,400	22,36,281	74,27,681

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	32,57,040.00
Equipment	75,000.00
Consumables	2,00,000.00
Travel Cost	9,50,000.00
Contingency	2,00,000.00
Any Other	26,00,000.00
Total Budget	74,27,681.00

The details of manpower and equipment required for the project is given below:

1 Research Fellows (JRF/SRF), 1 Research Assistants, 3 Field Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name	No of Unit
1	Laptop and Camera	2
2	Laptop and Camera	2

The Committee stated that the study must assess the impacts of rehabilitation of villages completed 20 years ago, 10 years ago, and that which is to be relocated. In addition different sizes of PAs/TRs and size of rehabilitated communities must also be considered while selecting the PAs/TRs and the impacts on habitat recovery and success in community rehabilitation. The Committee after deliberations, recommended the project subject to these conditions.

- 4.13 **“Assessment of the status of endemic and threatened plants across the protected areas of Arunachal Pradesh”**. PI of the project is Dr.Navendu Page, Scientist – C, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Dr. G S Rawat, Dr. Bivash Pandav, Dr. Gautam Talukdar and Dr Amit Kumar.

Details of the Project: The project is for a period of 3 years. The geographical locations of the project are Boleng, Siang in the State of Arunachal Pradesh.

PI/Co-PI made a presentation before the committee. In response to Committee’s observation that a number of studies have been carried out by ZSI and BSI, it was clarified that the present study would in addition to inventorisation, also undertake studies on spatial distribution of the endemic and threatened species. It was stated that Arunachal Pradesh is by and large unexplored and inaccessible. The PAs are very large and the biodiversity thereon have not been inventoried. BSI has done work but has not brought out State level reports on the flora of NE India. The present project would cover all the PAs of the State of Arunachal Pradesh.

Objectives of the project:

- i. To generate a comprehensive database on the distribution of endemic and threatened plants of north-east India with a special focus on the state of Arunachal Pradesh.
- ii. To identifying priority species for conservation by carrying out species conservation status assessment using IUCN red list criteria.
- iii. To produce a pictorial book on the distribution and conservation status of endemic and threatened woody plants of north-east India.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 years	2418000	1808000	3149760	73,75,760

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	14,45,760.00
Equipment	5,10,000.00
Consumables	9,10,000.00
Travel Cost	22,50,000.00
Contingency	1,50,000.00
Any Other - Field Accommodation @ Rs 2,70,000 - Publications @ Rs 8,00,000 - Organising Workshops with Regional Experts and Organisations @ Rs 5,00,000	21,10,000.00
Total Budget	73,75,760.00

The details of manpower and equipment required for the project is given below:

1 Research Fellow (JRF/SRF), 1 Expert and 2 Field Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name	No of Unit
1	Camera with lens	1
2	Binocular	1
3	Camera flash	2
4	Tripod	1
5	Densimeter	1
6	Range Finder	1
7	GPS	1
8	Pocket Weighing Balance	1

Expected outputs of the project:

- i. Final technical report highlighting the results and the findings of the study will be submitted to the steering committee and ministry.
- ii. Key findings of the study will be presented in conferences as well as published in peer reviewed scientific journals.
- iii. Copy and details of the research publications resulting from the study will also be submitted at the time of submission of the final technical report.
- iv. Project findings such as distribution maps and photographs will be integrated in open source online databases such as North-East Biodiversity Portal and the India Biodiversity Portal.
- v. A pictorial book featuring the endemic and threatened plants of north-east India along with their distribution and threat status will be produced.

Expected outcome of the project:

- i. The information generated on the geographic distribution of endemic and threatened species will serve as a baseline for the ministry and other bodies for taking necessary decisions on management and conservation of these species.
- ii. Species distribution maps and priority species and areas identified would help in developing species recovery plans and other such conservation policies in north-east India.
- iii. This information and data will be available to a wide range of stake holders through online data portals and books. This will empower them to take informed decision while planning and executing their research and in making conservation recommendations.
- iv. The database on distribution and status of endemic species will certainly help reduce the existing gaps in our knowledge and further help in identifying the remaining gaps that need to be addressed.

The Committee was of the view that the WII study should be in collaboration with BSI and ZSI so that there is no overlapping/duplication of work. The Committee after deliberations recommended the project for funding subject to this condition.

- 4.14 **“An integrated approach for conservation of Takin (*Budorcas taxicolor*) in North East India: Linking species ecology, traditional ecological knowledge”**. PI of the project is Dr. Gopi. G. V., Scientist – E, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Dr. S.Sathyakumar, Dr. K.Sivakumar and Dr. Parag Nigam.

Details of the Project: The project is for a period of 3 years. The geographical location of the project is Anini, Dibang Valley in the State of Arunachal Pradesh.

PI/Co-PI made a presentation before the committee. The Takin, also called cattle chamois or gnu goat, is a goat-antelope found in the eastern Himalayas. The four subspecies are: *B. t. taxicolor*, the Mishmi Takin; *B. t. bedfordi*, the Shaanxi Takin or Golden Takin; *B. t. tibetana*, the Tibetan or Sichuan Takin; and *B. t. whitei*, the Bhutan Takin. It was stated that the conservation of Takin (*Budorcas taxicolor*) is extremely vital as only one Genus exists in the country today and in this region. Takin is a prey for tigers in the region which follow the Takin in the regions where they are distributed. Only two studies and that too of a very limited duration have been carried out in Arunachal Pradesh.

Objectives of the project:

- i. Assessment of distribution and status of Takin in Arunachal Pradesh and Sikkim
- ii. To predict its current distribution and to forecast potential changes in its distribution under plausible climate change projections using an ensemble species distribution modelling approach to relate the occurrence records of Takin to environmental conditions
- iii. Understand the local and transboundary movement pattern of takin in the landscape

- iv. Identify threats including evaluation of traditional ecological knowledge (human dependence and use) on Takins and
- v. Develop a conservation action plan for this species in Arunachal Pradesh and Sikkim etc.

Expected outputs of the project:

- i. Results of this study are expected to lead to the identification of key area conservation sites for Takin.
- ii. This survey is the first step towards establishing a long term research and conservation program on Takin in Arunachal Pradesh.

Expected outcome of the project:

- i. The major outcome of the project will be generating knowledge of Ecology of Takins and Identification of Critical Takin Areas in Arunachal Pradesh in Sikkim.
- ii. Conservation Plan for Takins in Arunachal Pradesh and Sikkim.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 years	37,88,760	22,04,000	20,04,000	79,97,000

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	2741760.00
Equipment (Satellite Telemetry Device)	2635000.00
Consumable Cost	940000.00
Travel Cost	1500000.00
Contingency	180000.00
Any Other	0.00
Total Budget	79,96,760.00

The details of manpower and equipment required for the project is given below:

2 Research Fellow (JRF/SRF) and 6 Field Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name	No of Unit
1	Satellite Collars	5
2	GPS	2
3	Water proof Binoculars	2
4	Laser range Finder	1

The Committee desired that the aspect covering Climate Change be deleted from scope of study. This was agreed to. The Committee after deliberations recommended the project for funding.

4.15 **“Assessment of Disease Prevalence in Ungulates in Protected Areas of North East India”**. PI of the project is Dr. S. Sathyakumar, Scientist – G, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Prof. Qamar Qureshi, Dr. Vishnupriya Kolipakkam and Dr. T.K. Dutta.

Details of the Project: The project is for a period of 2 Years 6 Months. The geographical location of the project covers 3 States of NE India - West Phaileng, Mamit, Mizoram, Sikkim and Arunachal Pradesh.

PI/Co-PI made a presentation before the committee. It was clarified that there are very few studies especially in NE region on the extent of diseases relating to wild animals, their transmission and area of disease prevalence and this study would form baseline on the diseases relating to ungulates in the region.

Objectives of the project:

- i. To assess the prevalence of infectious diseases in selected PAs of NE India with special reference to pathogens that caused mortality of wild ungulates in the recent past.
- ii. To assess the prevalence of transmissible diseases in domestic counterparts in and around the PAs.
- iii. To understand the distribution and dynamics of diseases that has been documented in the selected areas both in domestic and wild animals.

Expected outputs of the project:

- i. Baseline disease prevalence data on diseases in wild ungulates of North Eastern Region. (Population-level status of infectious agents)
- ii. Identification of pathogens from domestic animals and identify the diseases that are at higher risk of being introduced/ reintroduced in the wild and those that are a threat to conservation.
- iii. Health Management Plan and SOPs for surveillance and monitoring of wildlife diseases in PAs

Expected outcome of the project:

- i. The prevalence data generated from this study would help formulate better management plan for each Protected Area. (NWAP chapter 1, 2).

- ii. The information gathered from molecular epidemiology would help formulate strategies for prevention and management of transmission of shared diseases between domestic and wild ungulates. (NWAP chapters 2, 5 9).
- iii. The most critical outcome of the project is to come up with predictable model to help and forecast the disease occurrence and thereby aiding in future to prevent it. (NWAP chapters 5 2).
- iv. Formulation of appropriate control measures and implementation of strategies when an outbreak occurs. (NWAP chapter-5).
- v. Material and protocols generated would help strengthen field staff and veterinarians through training and workshops for local veterinarians and SFDs. (NWAP chapter -1)

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
2 Years 6 Months	52,62,180	45,37,980	7,39,378	1,05,39,538

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	2510880.00
Equipment	590000.00
Consumables	3220000.00
Travel Cost	3252000.00
Contingency	206658.00
Any Other	760000.00
Total Budget	1,05,39,538.00

The details of manpower and equipment required for the project is given below:

1 Research Fellow (JRF/SRF), 2 Research Assistants and 3 Field Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name	No of Unit
1	Freezer	1
2	Capture Equipments(Drop nets etc)	2
3	Surgical Instruments	2
4	GPS	2
5	Binocular	1
6	Camera	1

The Committee after deliberations recommended the project for funding subject to the outcomes being shared with the concerned Forest and Wildlife Departments as well as

Agriculture and Animal Husbandry for preparations of specific Plans to prevent and control the spread of such diseases as many of these are spread to the wild animals from domestic animals/birds.

- 4.16 **“Implementation of Monitoring System for Tigers - Intensive Protection and Ecological Status (MSTripES) in representative protected areas of North Eastern States of India”**. PI of the project is Prof. Qamar Qureshi, Scientist – G, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PI of the project is Dr.Y.V. Jhala.

Details of the Project: The project is for a period of 2 years. The geographical locations of the project are Pakke-Kessang, East Kameng in the State of Arunachal Pradesh, Manipur, Meghalaya, Assam, Sikkim.

PI/Co-PI made a presentation before the committee. It was stated that one PA would be selected from each of the aforesaid States for the study.

Objectives of the project:

- i. Use Information, Digital, GPS, GPRS, and GIS Technology along with Artificial Intelligence to design and implement smart patrolling system for PAs,
- ii. Use modern scientific tools and techniques for population assessment and monitoring of a) major fauna, b) habitat condition, and c) human impacts on the PAs.
- iii. Map and evaluate the extent and trends in human-wildlife conflict with an aim to assist in their mitigation,
- iv. Use the above information to generate informative reports that are readily available to managers and policy makers for adaptive management.
- v. Impart training to frontline staff for effective patrolling for law enforcement, ecological monitoring and conflict data recording,

Expected outputs of the project:

- i. Well trained frontline staff providing better surveillance
- ii. The database generated through this project will facilitate the park managers to develop management plan
- iii. Establishment of basic infrastructure for future monitoring

Expected outcome of the project:

- i. Strengthening of PA management and law enforcement
- ii. Establishment of a system for long term monitoring
- iii. Baseline information for managers
- iv. Quantitative method for protected area management and performance evaluation

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1 st Year (in Rs.)	Budget 2 nd Year (in Rs.)	Total Budget (in Rs.)
2 years	9449280	4008600	1,34,57,880

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	4560000.00
Equipment	4084000.00
Consumables	750000.00
Travel Cost	1000000.00
Contingency	263880.00
Any Other	2800000.00
Total Budget	1,34,57,880.00

The details of manpower and equipment required for the project is given below:

2 Research Fellow (JRF/SRF) are required for the project. Details of equipment required under the project are given below:

S.N.	Name	No of Unit
1	Mobile phones	100
2	Computer	15
3	GPS	5
4	Range finder	15
5	Compass	15
6	Server and storage accessories	1

The Committee considered this project along with that at S.N 4.5 and recommended the project for funding.

- 4.17 **“Status Survey and Genetic Study of Eastern Hog Deer (*Axis porcinus annamiticus*) populations in northeast India”**. PI of the project is Dr. Sandeep Kumar Gupta, Scientist – E, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PI of the project is Dr. S.A. Hussain.

Details of the Project: The project is for a period of 3 years. The geographical location of the project covers the States of Manipur, Tripura, NW Bengal, Mizoram.

PI/Co-PI made a presentation before the committee. It was stated that the species is in the IUCN Red List and is protected under Schedule I of the Wild Life (Protection) Act, 1972, wherein it has been upgraded from Schedule-III to Schedule-I under the Wildlife Protection Act, 1972, A small population of this sub-species was earlier reported from Manipur and is in urgent need for conservation.

Objectives of the project:

- i. To assess the genetic diversity of the hog deer populations in northeast India
- ii. To estimate home range and movement of hog deer in Tripura, NW Bengal, Mizoram and Manipur
- iii. To assess the feasibility of the captive breeding programme of eastern hog deer (*A. p. annamiticus*) etc.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1 st Year (in Rs.)	Budget 2 nd Year (in Rs.)	Budget 3 rd Year (in Rs.)	Total Budget (in Rs.)
3 Years	30,06,520	23,12,000	22,12,000	75,30,520

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	3035520.00
Equipment	1895000.00
Consumables – DNA Analysis Rs 2,00,000/- Next Generation Sequencing 15,00,000/-	1700000.00
Travel Cost	600000.00
Contingency	300000.00
Any Other	0.00
Total Budget	75,30,520.00

The details of manpower and equipment required for the project is given below:

2 Research Fellow (JRF/SRF), 1 Lab Assistant and 2 Field Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name	No of Unit
1	Drone Quadraceptor and accessories	1
2	Binoculars	2
3	Spotting scope	1
4	GPS	2

5	Compass	2
6	Digital Camera	2
7	Work Station Desktop	1
8	Telemetry System	5

Expected outputs of the project: To assess the genetic diversity of the hog deer populations in northeast India Deliverables - to evaluate the extensive genetic variation among the different hog deer populations from northeast India.

Expected outcome of the project: The output of the project will address the objectives of the scheme and the ministry in generating baseline information of threatened fauna. It will also address the NWAP objectives of status assessment of threatened species, conservation of threatened taxa, and identification of landscape level plan for *Axis porcinus annamiticus*.

The Committee desired that NW Bengal be also included in the study which was agreed to. The Committee after deliberation recommended the project for funding.

4.18 “Securing habitats for threatened mountain ungulates through robust population assessment and conservation planning”. PI of the project is Dr. Vishnupriya Kolipakam, Scientist – C, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PIs of the project are Dr. Sathyakumar, Dr. Sutirtha Dutta, Dr. Lallianpuii Kawlni and Dr. Amit Kumar.

Details of the Project: The project is for a period of 2 years & 6 months. The geographical locations of the project are Arunachal Pradesh, Tripura, Manipur and Mizoram, wherein one one PA from each State would be covered. (Sikkim has been dropped as ZSI is already working on this subject).

PI/Co-PI made a presentation before the committee. It was stated that the 3 selected ungulates - Serow, Goral and Tahr requiring urgent conservation measures. The Himalayan Serow is a goat-antelope native to the eastern Himalayas and eastern and south-eastern Bangladesh. It is listed as Near Threatened on the IUCN Red List because the population is considered to be declining due to habitat loss and hunting for its meat. The gorals are four species in the genus *Nemorhaedus* or *Naemorhedus*. They are small ungulates with a goat-like or antelope-like appearance. It is listed as near-threatened in the IUCN Red List. The Himalayan Tahr is a large even-toed ungulate native to the Himalayas in southern Tibet, northern Pakistan, northern India and Nepal. It is listed as Near Threatened on the IUCN Red List, as the population is declining due to hunting and habitat loss.

Objectives of the project:

- (i) To assess the population status of mountain ungulate community in representative sub-tropical and temperate Himalaya, with a special focus on Northeast region.
- (ii) To understand the abundance, habitat relationship and health status of threatened mountain ungulates of Serow, Goral and Tahr with increasing human population.

- (iii) To assess the genetic diversity, divergence and distinctiveness of the different sub species and/or populations of Serow, Goral and Tahr Species diversity that results in behavioural, morphological and physiological plasticity is the ingredient for evolutionary processes to operate.
- (iv) To develop conservation action plan for mountain ungulates through securing habitats and conservation prioritization of populations etc.

Expected outputs of the project:

- i. Monitoring protocol for mountain ungulates
- ii. Baseline information on the current population status and distribution of mountain ungulate populations with a special focus on Northeastern region
- iii. Identification of the specific habitat needs and optimum habitats of mountain ungulates, especially Serow, Goral and Tahr
- iv. Genetic diversity and viability of Serow, Goral and Tahr populations, status of inbreeding and their effective population sizes
- v. Conservation action plan for mountain ungulates
- vi. Health status and risk identification of mountain ungulates populations
- vii. Trained manpower, where forest department will be able to monitor ungulates self sustainably etc.

Expected outcome of the project:

- i. The output of developing a monitoring protocol for mountain ungulates will address the objectives of the scheme and the ministry in generating baseline information of threatened fauna, or little known and indicator species, developing an institutional mechanism to monitor the populations of endangered species and their habitats in all biogeographic regions.
- ii. Through the development of this monitoring protocol, build the capacity of State Forest departments and local DFOs to sustainably monitor wildlife, and in that contribute to the MoEFCC's objective of institutionalising capacity building programmes that would cater to the specific needs of the species, ecosystems (NWAP 3).
- iii. Evaluating the genetic characteristics of threatened populations of Serow, Goral and Tahr, will not only help prioritise populations to safeguard the full evolutionary potential of species, but also help in identifying and safeguarding genetically pure populations (NWAP 2, 2.1, 3).
- iv. Preparation of a conservation action plan involves assessing etc.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
2 years 6 Months	60,93,660	39,97,560	7,90,560	1,08,81,780

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	29,00,880.00
Equipment	17,40,000.00
Consumables - DNA Analysis - Disease Profiling - Sample Collection - Batteries, Computer products replacement	23,15,000.00
Travel Cost	32,52,000.00
Contingency	2,13,900.00
Any Other	4,60,000.00
Total Budget	1,08,81,780.00

The details of manpower and equipment required for the project is given below:

1 Research Fellow (JRF/SRF) and 2 Research Assistants, 1 Communication intern and 4 Field Assistants are required for the project. Details of equipment required under the project are given below:

S.N.	Name	No of Unit
1	Camera traps	75
2	Freezer	1
3	Field gear (sleeping bag, tents)	6
4	Binocular	2
5	GPS	2

The Committee after deliberations recommended the project for funding.

4.19 “Engaging Community In Conservation of Covert Species in Meghalaya, Northeast India”. PI of the project is Dr. Abhijit Das, Scientist – D, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand. Co-PI of the project are Sh. Salvador Lyngdoh and Sh. D.K. Vinod.

Details of the Project: The project is for a period of 3 years. The geographical location of the project is Mawphlang, East Khasi Hills, Meghalaya.

PI made a presentation before the committee. It was stated that the first year’s study would be mainly survey and in the second year capacity building would be taken up.

Objectives of the project:

- Ecological assessment of amphibian, birds and mammalian assemblage in Sacred groves of Meghalaya.

- ii. To determine species diversity and abundance of targeted taxa across different sacred groves of varying patch sizes.
- iii. To identify potential indicator species for long-term ecological monitoring of the habitat.
- iv. To develop a long-term monitoring and policy document towards conservation of Traditionally Conserved Areas (TCAs) of the state.
- v. To conduct hands-on training workshops for identification, monitoring and behavior studies
- vi. Documenting and disseminating ethno- zoological values involving target taxa etc.

Expected outputs of the project:

- i. Checklist, digital photo archive, natural history, breeding biology, Faunal apps with animal call
- ii. Faunal apps with animal call
- iii. Understanding patch size dynamics on vertebrate diversity and abundance
- iv. Awareness by workshop, training, colour awareness materials
- v. Scientific reports, Collaborative Research papers on New description, redescription, diversity, abundance in peer reviewed journals
- vi. Awareness programme for students/villagers in various schools of the landscape for sustainable use of Natural resources, NRs conservation and management etc.

Expected outcome of the project:

- i. Systematic documentation of selected vertebrate taxa for future conservation benefit
- ii. Population level data for future conservation intervention
- iii. Status and distribution of rare, threatened and endemic biodiversity in poorly known taxa such as amphibians
- iv. Skill development in local youths for biodiversity documentation
- v. and monitoring
- vi. Involving community for long term conservation benefit
- vii. Aiding documentation of People Biodiversity Register
- viii. Systematic documentation of selected vertebrate taxa for future conservation benefit.

The proposed cost of the project and year-wise break-up of the cost is given below:

Tenure of the project	Budget 1st Year (in Rs.)	Budget 2nd Year (in Rs.)	Budget 3rd Year (in Rs.)	Total Budget (in Rs.)
3 years	38,11,044	20,99,840	20,55,520	79,66,404

The component-wise break-up of cost of the project is given below (in Rs.):

COMPONENT	COST
Salary	31,81,200.00
Equipment	16,45,000.00
Consumables –Batteries for Camera, for GPS - Field Equipment - Glassware, Chemicals for DNA Analysis, etc	7,25,000.00
Travel Cost	15,25,000.00
Contingency	1,56,204.00
Any Other – Base Camp Establishment Maintenance of Field Equipment, GPS, etc - Printing, Publication	2,34,000.00 + 5,00,000
Total Budget	79,66,404.00

The details of manpower and equipment required for the project is given below:

2 Research Fellows (JRF/SRF), 2 Research Assistants, 2 volunteers and 4 Field Assistants are required for the project. Details of equipment required under the project are given below:

S. N.	Name	No. of Unit
1	Camera Traps	60
2	Call Recorder and Microphone	1
3	Projector	1
4	Deep Freezer	2
5	Digital Compact Camera	5
6	Range Finder	2
7	Binocular	5
8	Head Lamp	10
9	Torch	10
10	GPS	2
11	Laptop	1

The Committee after deliberations recommended the project for funding subject to condition that capacity building is taken as soon as the project commences and continues until end of project.

5.0 Any other item for discussion:

- 5.1 “**Habitat Ecology and Species Diversity of Cordyceps in district Pithoragarh, Central Himalayas**” by Dr. Chandra Singh Negi, Department of Zoology, LSM Government Post Graduate College, Pithoragarh (Uttarakhand), Pithoragarh (F.No. 14/27/2010-ERS/RE)

Project Details: The project was started on 31.01.2012 for a period of 3 years with a total cost of Rs. 23,81,750/-. Project tenure was over on 30.01.2015. A total of Rs 19,18,100/- has been released so far out of approved project cost of Rs. 23,81,750/-. This case was considered in 2nd SC meeting held on 18th July, 2018. The PI has attended the meeting.

Now, PI has informed that he has been transferred from LSM Government Post Graduate College, Pithoragarh to M.B. PG College, Haldwani (Nainital). PI has informed that the equipment purchased under this project remain obligatory for the conduction of the project sanctioned by G. B. Pant National Institute of Himalayan Environment & Sustainable Development, Kosi-Katarmal under NMHS, MoEFCC and more so under a similar subject i.e. Yartsa Gunbu (*Ophiocordyceps sinensis*).

PI has also informed that one of his projects on Mushrooms is in the final stages of getting financed by MoEFCC (Wildlife Division), which too would necessitate the use of the above mentioned equipment and these equipment have been mentioned as “already in possession” with other new equipment being asked for under the project submitted to the authority.

Now, PI has requested to give him concurrence to transfer the equipment and accessories purchased under this project to his new college M.B. PG College, Haldwani (Nainital) towards the overall smooth conduction of the project.

The details of equipment for a total cost of Rs 7.99 crores funded under the R&D Scheme sought for transfer the Project of G. B. Pant National Institute of Himalayan Environment & Sustainable Development, Kosi-Katarmal under the National Mission on Himalayan Studies (NMNH), MoEFCC are given below:

S.N	Name of Equipment	Cost in (Rs)
1.	Lyophilizer-MAC, MSW-137	3,00,510.00
2.	Micro Kjeldahl Digestion unit-MAC, Model MKDU-6	11,130.00
3.	Electronic digital balance – citizen Model No. CY320	31,238.00
4.	Motorless magnetic stirrer-tarsons	5,460.00
5.	All Quartz double distillation apparatus – Borosil	1,09,066.00
6.	Micro Centrifuge – Tarsons, Spinwin MC-01	19,950.00
7.	Hot air oven-Memmert German Type, Pooja Scientific instruments, Model PSI-005	14,625.00
8.	UV/VIS spectrophotometer (single beam) – METASH Instruments Co. Ltd. Model UV 5100 B	1,00,688.00
9.	Rotary vacuum evaporator (complete set)- Pooja Scientific Instruments, Model PSI-038	55,125.00
10.	Rotaryshaker-Pooja Scientific Instruments, Model PSI-045	20,813.00
11.	Deep freeze- KHERA, Model KI-219, Capacity 100 Liters	67,500.00
12.	Microprocessor based Flame Photometer- KHERA, Model KI-267	63,000.00
	Total	7,99,105.00

The Committee noted that the PI has completed the project in 2015 but settlement of dues and formalities for completion are still incomplete. The PI is planning to pursue a similar project on Yartsa Gunbu (*Ophiocordyceps sinensis*) in his new institution, namely M.B. PG College, Haldwani (Nainital) sanctioned by G. B. Pant National Institute of Himalayan Environment & Sustainable Development (an autonomous institute of the MoEFCC), Kosi-Katarmal under NMHS. The Committee further noted that HOD of his present institution, namely LSM Government Post Graduate College, Pithoragarh has given him an NOC permitting him to take the equipment for the new project. The Committee after deliberations decided that the Ministry could give approval for the PI to take the equipment to the new institution, namely M.B. PG College, Haldwani (Nainital) under the following conditions:

- (i) For completion of the project with MoEFCC and for settlement of dues, the following documents - GFR 12A and GFR -19 are required to be submitted by the PI through PFMS Portal and the Expenditure Statement & Utilisation Certificate are required to be uploaded on the PFMS Portal.
- (ii) Furnish an Undertaking counter signed by the HOD of M.B. PG College, Haldwani (Nainital) and by Director, G. B. Pant National Institute of Himalayan Environment & Sustainable Development, Kosi-Katarmal that the equipment so transferred to his new institution (M.B. PG College, Haldwani), shall be transferred to G. B. Pant National Institute of Himalayan Environment & Sustainable Development, Kosi-Katarmal, Almora at the end of the project undertaken by the PI under NMHS.

6.0 Concluding Remarks

6.1 The Committee emphasised the need to address gaps in existing data and information available. Wherever similar/earlier studies have been already carried out, WII must collate and synergise with the studies and only such aspects/area/regions should be taken up not studied/covered/addressed in earlier studies. WII must disseminate outcomes of the projects through a series of workshops. Capacity building and internalisation of the outcomes should be part of the project so that that effective management plans prepared thereon are implemented.

6.2 The Committee strongly recommended that Monitoring Committees are set up for each project to monitor the status of implementation of these 19 projects of Wildlife Institute of India, Dehradun. The Monitoring Committee should comprise of 2 or 3 experts nominated by the Ministry for each project of which at least one is a subject expert. In addition, one senior level representative of the State Forest Department representing the CWLW should be included to accompany the Committee. In addition, Ministry may also monitor the financial expenditure and status of the projects by deputing representative from Internal Finance Division of the MoEFCC to WII, Dehradun. The costs for the visit of the Technical experts and for financial monitoring of the projects shall be met from the budget of the R&D Scheme for Conservation and Development.

6.3 Dr.T.Chandini, Advisor, MoEFCC summed up the discussions and the following issues were highlighted:

- i) The scope of work should be that which does not duplicate the work/overlap with work already undertaken on the subject. The PI and Co-PIs must undertake detailed pre-project review on the work already done and collate the data/status already available.

Wherever indicated under the 19 projects, WII must work with and synergise with relevant institutions.

ii) The Scheme does not permit purchase of equipment already available with institutions. The equipment being purchased under the 19 projects involve two types- one in the main WII and the second required in the field studies. Equipment already available – both at WII and in the field with WII must be utilised and new equipment must not be purchased without proper justification. Certificate from Director, WII in this regard is essential.

iii) The Certificate of Undertaking regard to i) and ii) above has been given by PIs of the 19 projects instead of Director, Wildlife Institute of India. The Certificate duly signed and attested by Director, WII is required to be uploaded afresh for all 19 projects on the MIS-Portal for each project.

iv) During the course of presentation it was indicated by several PIs/Co-PIs that the Proforma available on the MIS-Portal has certain flaws. These are given below:

a) No provision given for multiple entries for more than one geographical location for both PAN-India as well as for NE projects which involve several States/PAs. In case of project on A&N Islands, the details of Islands and area offshore to be studied are required. This includes all the details sought in Part B (8) of the Proforma including name of PAs, Lat-Long of the field study and maps of all States/regions (in case of landscape projects) of all the 19 projects and for islands (name and location including Lat-Long and maps) in case of project on A&N islands.

b) No provision for entry of details of Co-PIs of the project.

v) In order to address this issue, the details of Co-PIs for revising i) Part A (1) of the Proforma, ii) the details sought in Part B (8) of the Proforma including name of PAs, Lat-Long of the field study and maps of all States/regions (in case of landscape projects) and islands (name and location including Lat-Long and maps) of all the 19 projects and iii) The Certificate of Undertaking by Director, Wildlife Institute of India in regard to 6.3 i), ii) and iii) above should be e-mailed to Web Administrator of the MIS Portal <https://repmissmoef.nic.in> from the Section “CONTACT US” for each of the 19 projects.

vi) Only those projects recommended by the Committee complete in all forms will be processed for approval of the Competent Authority for release of funds.

5.4 Shri AK Mehta, Additional Secretary stated that that the timely start and implementation of these projects should help the ministry in the implementation of the NWAP 2017-2031 and for conservation of biodiversity. The outcome of these projects must be shared with the concerned State Departments and internalised in their management of PAs and conservation programmes for various landscapes of the country.

The Committee after deliberations ended the meeting with a Vote of Thanks to the Chair.

ANNEXURE-1**LIST OF PARTICIPANTS OF THE FIFTH MEETING OF STEERING COMMITTEE ON R&D SCHEME HELD ON 28TH NOVEMBER 2018**

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| 1. Shri A. K. Mehta, Addl. Secretary, MoEFCC | Chairperson |
| 2. Dr. Kailash Chandra, Director, Zoological Survey of India | Member |
| 3. Dr. V.B. Mathur, Director, Wildlife Institute of India, Dehradun | Member |
| 4. Dr. T. Chandini, Advisor, MoEFCC | Member-Secretary |

SPECIAL INVITEES:

1. Dr. Pradeep Vyas, (Retd.) IFS (Former CWLW, Govt of WB)
2. Shri N.K. Vasu, (Retd.) IFS (Former PCCF, Assam)
3. Dr. A.K. Gupta, (Retd.) IFS (Former PCCF and CWLW, Tripura)
4. Prof C.R. Babu (Retd.) (Prof Emeritus, University of Delhi)

MOEFCC

1. Shri Roy P. Thomas, Consultant, Wildlife Division, MoEFCC

(RE Division)

2. Sh. B.K. Haldar, SO (RE)
3. Ms. Akankasha Sanchan, ASO
4. Sh. Sandeep Bharti, Project Assistant (RE)

PROJECT INVESTIGATORS/Co-Investigators

1. Shri Abhijit Das, WII, Dehradun
 2. Ms Vishnupriya Kolipakam, WII, Dehradun
 3. Dr. Navendu Page, WII, Dehradun
 4. Shri J.A. Johnson, WII, Dehradun
 5. Nehru P, WII, Dehradun
 6. Ms. Sutirtha Dutta WII, Dehradun
 7. Ms Anju Baroth, WII, Dehradun
 8. Dr. K. Sivakumar, WII, Dehradun
 9. Ms. Shikha Bisht, WII, Dehradun
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ANNEXURE-2

Details of 19 Projects of Wildlife Institute of India for Funding under R&D Scheme for Conservation & Development

S. N.	Name of P.I.	Co-Investigators	Project Title	Region wise	Total Cost (Rs)	Year-1	Year-2	Year-3
1.	Amit Kumar	Dr. B.S. Adhikari, Prof. Qamar Qureshi Dr. Navendu Page Dr. G.S. Rawat	Ecological impacts of major Invasive Alien Species (IAS) on native flora and fauna in the Protected Areas (PAs) of North, Central and North-East India	PAN - India	77,34,880	34,82,960	22,42,960	20,08,960
2.	Dr. Gautam Talukdar	Ajay Srivastava, K. Sivakumar, Suresh Kumar and Dr Anju Baroth.	Ecology and Recovery of critically endangered Vulture species in Pong Dam Protected Area (PA) and its Eco Sensitive Zone (ESZ) in Himachal Pradesh	PAN-India	85,25,760	32,28,000	32,78,000	20,19,760
3.	Malvika Onial	Dr Bivash Pandav Dr Bilal Habib Dr Sutirtha Dutta Dr Vishnupriya Kolipakam Dr R Suresh Kumar Dr YV Jhala Prof Qamar Qureshi	Assessing effects of linear infrastructure on wildlife: Landscape level characterisation and spatial prioritisation for impact mitigation	PAN - India	1,17,54,000	44,24,000	37,85,000	35,45,000
4.	Dr. K. Sivakumar		Inventorisation and Assessment of RET Species in select Protected Areas and their Eco-sensitive Zones of India	PAN - India	1,84,35,280	88,88,000	56,88,000	38,59,280
5.	Y. V. Jhala	Qamar Qureshi	Implementation of Monitoring System for Tigers (MSTriPES) in representative Protected Areas of India	PAN - India	1,48,24,272	94,90,080	53,34,192	-
6.	Bivash Pandav, Scientist F	Dr. Samrat Mondol, Scientist D Dr. Parag Nigam, Scientist F	A landscape-level assessment of elephant occupancy, habitat status, threats, genetic composition and human-elephant conflicts across Terai-Arc landscape for population management and conflict mitigation	PAN - India	78,23,040	38,77,760	22,01,760	17,43,520
7.	J.A. Johnson	Dr. Gopi G.V. Dr. K.Sivakumar Dr. S. A. Hussain	Ecology of selected High-Altitude wetlands in two biodiversity hotspots of India for developing Conservation and Management Plans	PAN - India	62,55,520	32,46,500	16,76,500	13,32,520
8.	Nehru P	Dr. K. Sivakumar Dr. Alok saxena	Evaluating the ecosystem services of mangroves and seagrasses in Andaman and Nicobar islands with special reference to climate change	A&N Islands	78,94,963	34,46,376	21,00,996	23,47,591
9.	Sutirtha Dutta	Dr. Y. V. Jhala Dr. K. Sivakumar Mr. Qamar Qureshi Dr. Vishnupriya Kolipakam Dr. Navendu Page Dr. Lallianpui Kawlni Dr. G. S. Bhardwaj (ext) Mr. Devesh Gadhi (ext)	Conservation planning based on ecology of the endangered Lesser Florican and assessment of provisioning services in multiple-use semiarid landscapes	PAN - India	80,75,000	46,61,000	23,51,000	10,63,000

10.	Samrat Mondol	Dr. Bivash Pandav, Scientist F Dr. Parag Nigam, Scientist F Dr. Bilal Habib, Scientist E Dr. Navendu Page, Scientist C	Assessing fine scale distribution pattern, population and habitat status of northern Swamp deer (<i>Rucervus duvauceli duvauceli</i>) across upper Gangetic Plains of north India	PAN - India	66,78,760	35,63,000	16,87,000	14,28,760
11.	Anju Baroth	Gautam Talukdar K. Sivakumar	Ecological Implications of Plastic waste generation from various sectors in the context of Coastal and Marine Ecosystem in the coastal States of India	PAN - India	80,83,634	2,76,118	20,63,738	32,58,778
12.	Ruchi Badola	Anil Kumar Bhardwaj S.A. Hussain Pariva Dobriyal Hemelata Khanduri	A study on the relocation and rehabilitation of local communities from PAs/Tiger Reserves	PAN - India	74,27,681	28,09,300	23,82,400	22,36,281
13.	Navendu Page	Dr. G S Rawat Dr. Bivash Pandav Dr. Gautam Talukdar Dr Amit Kumar	Assessment of the status of endemic and threatened plants across the protected areas of Arunachal Pradesh	North-East	73,75,760	2418000	1808000	3149760
14.	Gopi.G.V	Dr.S.Sathyakumar Dr.K.Sivakumar Dr. Parag Nigam	An integrated approach for conservation of Takin (<i>Budorcas taxicolor</i>) in North East India: Linking species ecology, traditional ecological knowledge	North-East	79,97,000	37,88,760	22,04,000	20,04,000
15.	S. Sathyakumar/ Lallianpuii Kawlni	Prof. Qamar Qureshi Dr. Vishnupriya Kolipakkam Dr. T.K. Dutta	Assessment of Disease Prevalence in Ungulates in Protected Areas of North East India.	North-East	1,05,39,538	52,62,180	45,37,980	7,39,378
16.	Qamar Qureshi	Y.V. Jhala	Implementation of MSTripES in representative Protected Areas of North East India	North-East	1,34,57,880	9449280	4008600	-
17.	SK Gupta	Dr. SA Hussain	Status Survey and Genetic Study of eastern Hog Deer (<i>Axis porcinus annamiticus</i>) Populations in Northeast India	North-East	75,30,520	30,06,520	23,12,000	22,12,000
18.	Qamar Qureshi Vishnupriya Kolipakam	Dr. Sathyakumar Dr. Sutirtha Dutta Dr. Lallianpuii Kawlni Dr. Amit Kumar	Securing habitats for threatened mountain ungulates through robust population assessment and conservation planning	North-East	1,08,81,780	60,93,660	39,97,560	7,90,560
19.	Abhijit Das	Sh. Salvador Lyngdoh Sh. Dk Vinod, IFS	Ecological assessment of Mammalian, Birds and Amphibian assemblage in Sacred groves of Meghalaya	North-East	79,66,404	38,11,044	20,99,840	20,55,520
TOTAL COST OF 19 PROJECTS					17,92,61,672	8,52,22,538	5,57,59,526	3,57,94,668