ITUWTSA
NEW DELHI 2024

Office of the General Manager
(Subhadra Area)
At/Po :Angul, Near Biju Maidan
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Phone No- 06764-296537

MCL

Ref No: MCL/GM(SA)/2024/ 1083

Date: 27.12.2024
28

To,

Divisional Forest Officer
Angul, Forest Division

Sub: Proposal for seeking prior approval of the Central Government under Section 2 (ii) of the forest (Conservation) Act, 1980 in favour of M/s Mahanadi Coalfield Ltd. for non forestry use of 125.24 ha of forest land for Subhadra Open Cast Coal Mining Project of Subhadra Area under Angul Forest Division and District Angul of Odisha State – **Submission of point wise compliance report of shortcomings raised by MoEF&CC, New Delhi**

Ref.No- (i) Proposal No. FP/OR/ MIN/150133/ 2021.
(ii) Letter dtd- 17.12.2024 of AIG of Forests, GoI, MoEF&CC, (FC Division), New Delhi
(iii) Letter no-10623-DRP/dated-23.12.2024

Dear Sir,

In reference to the above letters, please find attached herewith point wise Compliance report along with all the relevant documents as per observations/ shortcomings raised by MoEF&CC, GoI, New Delhi in 05 sets for necessary action please.

Regards

Encl: As above

Yours faithfully

27/12/24

General Manager
Subhadra Area

For kind information to:
1. CMD, MCL
2. DT (Op/P&P)), MCL
3. D (F), MCL
4. GM (E&F), MCL
5. GM (P&P), MCL
6. GM (CMC), MCL
7. GM (L&R), MCL

Copy to:
1. Project Officer, Subhadra Project / SO (Min/P&P), Subhadra Area
2. SO (L&R), SO (Survey/E&F), Subhadra Area
3. Project Head, M/s SCML

COMPLIANCE TO SHORTCOMINGS RAISED BY MOEF & CC ON 17.12.2024.

Sl No.	Shortcomings	Compliance
1	With regard to conditions no. 8 of the 'in-principle' approval, The State Government has not submitted the revised the RWMP/SSWCP plans. The same needs to be submitted.	In compliance to the shortcoming with regard to conditions no-8 of the 'in-principle' approval, the approved RWMP/SSWCP is attached herewith for necessary action.
2	With regard to conditions no. 10 of the 'in Principle' approval, User agency has not uploaded KML files of diverted area, the CA areas, the proposed SMC treatment area and the WLMP area on the e-Green watch portal.	With regard to the shortcoming of condition no 10 of the 'in Principle' approval that the User agency has not uploaded KML files of diverted area, the CA areas, the proposed SMC treatment area and the WLMP area on the e-Green watch portal, it is submitted that the Project Proponent does not have access to e-Green watch portal for uploading the KML files of diverted area, the CA areas, the proposed SMC treatment area & the WLMP area. Hence the KML files of diverted area, the CA areas, the proposed SMC treatment area & the WLMP area are being submitted in soft copy (in pen-drive) for necessary action please.
3	With regard to conditions no. 12 of the 'in- principle' approval, the State Government has not submitted approved scheme towards demarcation of safety zone (7.5-meter strip all along the inner boundary of the mining lease area) along with budgetary provisions. The same needs to be submitted.	• Condition no-12 of 'in- principle' approval mandates to undertake all the listed activities at project cost by the User Agency for the management of Safety Zone as per relevant guidelines issued by the Ministry. • According to the stipulated Conditions of In-principle approval, "Approved Scheme" towards demarcation of safety zone (7.5-meter strip all along the inner boundary of the mining lease area) along with budgetary provisions has not been mandated. • In compliance to this Condition, 04 (Four) nos of Undertakings in accordance with Conditions 12(a), 12(b), 12(c) & 12 (d) were submitted while complying Stage-I Forest Clearance conditions on 23.10.2024.

Subhadra Coal Mining Limited

Authorised Signatory

		• Again 04 (Four) nos of Undertakings w.r.t. Conditions 12(a), 12(b) ,12(c) & 12 (d) are being submitted for kind consideration.

Subhadra Coal Mining Limited

Authorised Signatory

महा प्रबंधक
एमसीएल, सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area

Staff Officer(Envt.& Forest)
MCL Subhada Area

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Phone No- 06764-296537

MCL

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 12 (a) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that the "User agency shall ensure demarcation of Safety Zone (7.5-meter strip all along the inner boundary of the mining lease area), and its fencing, protection and regeneration by erecting adequate number of 6 feet high RCC boundary pillars inscribed with DGPS co-ordinates with barbed wire fencing and deploying adequate numbers of watchers under the supervision of the State Forest Department"

General Manager
Subhadra Area, MCL

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MCL

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 12 (b) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that the "Boundary of the safety zone of the mining lease, adjacent to habitation / roads, should be properly fenced by the user agency".

General Manager
Subhadra Area, MCL

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MCL

UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 12 (c) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that the "Safety zone shall be maintained as green belt around mining lease and to ensure dense canopy in the area, regeneration shall be taken up in this area by the user agency at project cost under the supervision of State Forest Department"

General Manager
Subhadra Area, MCL

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MCL

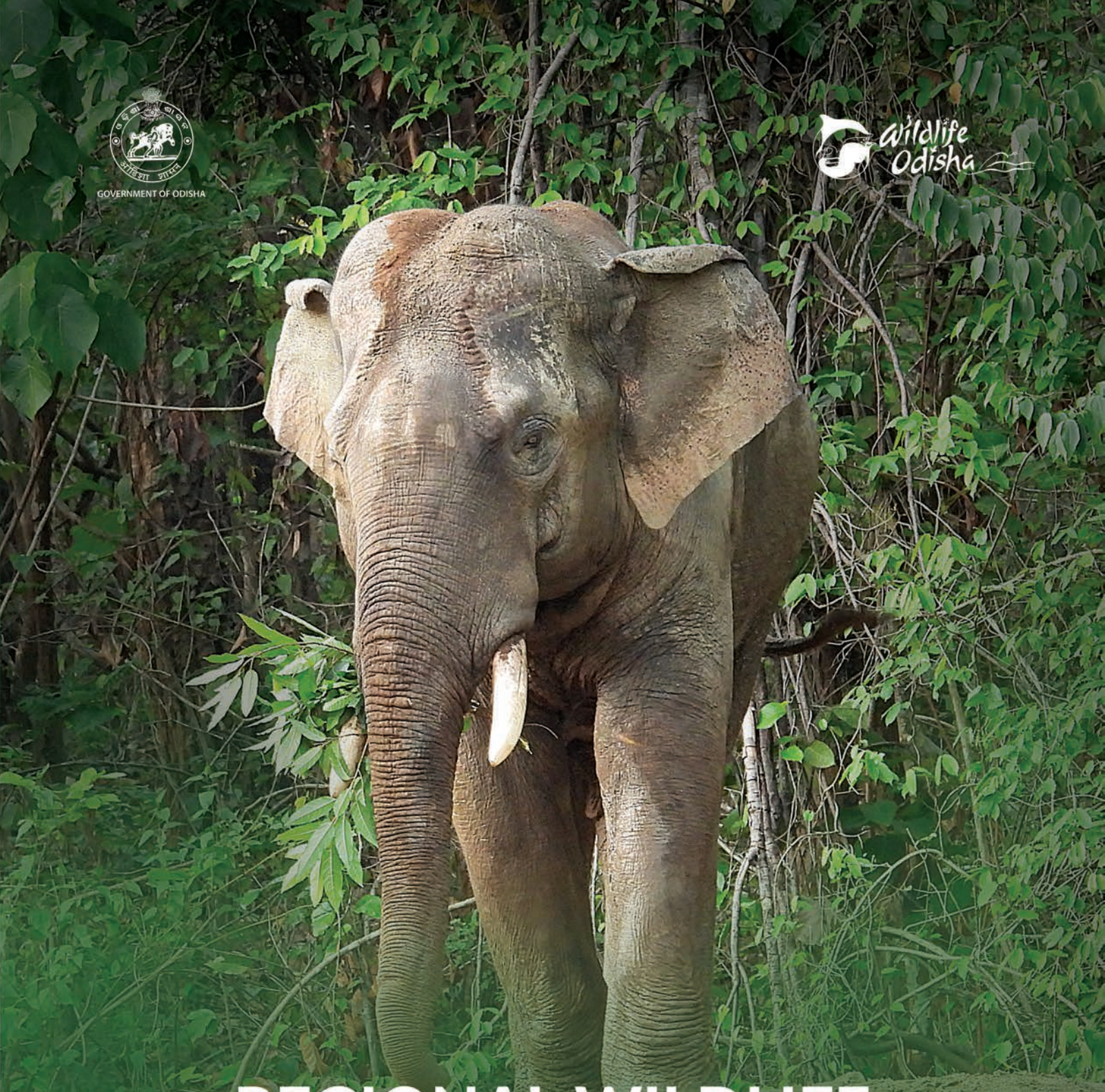
UNDERTAKING

PROPOSAL NO.:- FP / OR / MIN / 150133 / 2021

(In compliance to Condition No. 12 (d) of In-Principle Approval (Stage-I) for Forest Clearance granted in favour of Subhadra OCP of M/s Mahanadi Coalfields Limited (MCL) vide No. 8-06/2023-FC Dt. 05-12-2023)

I do hereby undertake that "The user Agency shall ensure that safety zone is maintained as per the prescribed norms".

General Manager
Subhadra Area, MCL



GOVERNMENT OF ODISHA

Wildlife Odisha

REGIONAL WILDLIFE MANAGEMENT PLAN

(2024-25 to 2033-34)

STATE WILDLIFE ORGANISATION

Forest, Environment and Climate Change Department
Government of Odisha

REGIONAL WILDLIFE MANAGEMENT PLAN

(2024-25 to 2033-34)

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)
& CHIEF WILDLIFE WARDEN, ODISHA
Department of Forest and Environment, Government of Odisha

Office Order No. 11409 /8WL-CAMPA -0002/2022
Bhubaneswar, the dated 23rd September, 2024

The Regional Wildlife Management Plan for the years from 2024-25 to 2033-34 prepared by Wildlife Conservation Officer (WLCO) of this office has been scrutinised by the committee constituted vide this Office Order No.5956 dated 28.05.2024 under the chairmanship of Chief Conservator of Forests (WL-I). The committee after through scrutinization of the said plan has recommended the same to the undersigned for taking final decision.

In due consideration of the recommendation of the committee, the undersigned approves the same for implementation from 2024-25 to 2033-34.

Principal CCF (WL) & CWLW, Odisha.

PRAKRUTI BHAWAN, PLOT No.1459, SAHEED NAGAR, BHUBANESWAR-751007
Website:www.wildlife.odisha.gov.in, Email: odishawildlife@gmail.com

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PREFACE

The state of Odisha, the land of dense forest, pristine beaches, scenic wetlands and divine landscapes has been protecting all forms of wild flora and fauna since time immemorial thereby maintaining a fine and delicate balance between conservation and development. However, with rise in human population, rapid industrialization and increase in infrastructural projects, the balance has lately been disturbed and wildlife and their habitat has taken a toll during the first few decades of the century.

For reversing this trend, efforts have been initiated through various scientific interventions in Protected Areas and other Wildlife areas under different Central Sponsored Schemes, State Plans, CAMPA funds, Site Specific Wildlife Conservation Plans and through other funding mechanism for last few years.

With a vision to a have a holistic approach for protection, conservation and management of Wildlife throughout the mining impact area, provision of a Regional Wildlife Management Plan Fund has been formulated for which different user agencies undertaking mining in various parts of the state have deposited fund in the tune of 372.93 Crores up to September, 2023.

In recent years, the Wildlife Protection Act and the Forest Conservation act have gone through various amendments and the conditions stipulated under Environmental Clearance, Forest Clearance, Wildlife Clearance for various mining, infrastructural development, industrial projects have brought a new dimension to wildlife management in Protected Areas, connecting corridors and movement areas.

At present, because of the intensive wildlife management interventions under the supervision of the state wildlife headquarters, Similipal Tiger Reserve has emerged as the prime tiger habitat in eastern Indian landscape with more than 35 tigers and the only source population of pseudo-melanistic tigers in the world, elephants have started colonizing new landscapes of the state with extensive inter-division and inter-state movements, frequent leopards signs have been recorded from most of the forest divisions, more wetlands are now recognized under Ramsar conventions, area under mangrove vegetation is increasing in the state, olive ridley mass nesting number is increasing with less number of mortality due to effective enforcement against illegal fishing but challenges of managing elephant related conflicts, habitat fragmentation, reduction of functionality of wildlife movement areas and wildlife crimes related to leopard, pangolin and for bushmeat are to be addressed in time bound manner.

As the funding from various Central Sponsored Schemes (Project Tiger, Project Elephant and Integrated Development of Wildlife Habitat), State Plan (Wildlife Protection and Conservation Measures & Management of Elephant and Corridors) and Site Specific Wildlife Management Plans are limited, localized and based on yearly formulated APO, need of a comprehensive long term wildlife management plan was felt.

Looking at the wildlife abundance, daily movement, seasonal migration, functionality of corridors, conflicts and crime scenario, various management interventions have been formulated under this plan to be implemented throughout the state for the next 10 years. This comprehensive Regional Wildlife Management Plan has been prepared taking a futuristic science based active management prescriptions based on the field requirements, divisional level SWOT analysis and stakeholders' consultations.

Thus a 10 years comprehensive Regional Wildlife Management Plan for the period 2024-25 to 2033-34 is present herewith…

INTRODUCTION

CHAPTER 1

1.1 About Odisha

The State of Odisha has a Geographical Area of 1,55,707sq km (Plate 1). The Forest cover is 52,155.95 sq. km. which is 33.50 % of its Geographical Area as per the India State of Forest Report (ISFR), 2021 (Plate 2). The state has 6793.058 Sq.km of area under the status protected area which is 4.36% of total geographical area (Wildlife Odisha 2023). The state has 19 Wildlife Sanctuaries, one National Park (Bhitarkanika), two Conservation Reserve (Similipal-Hadagarh-Kuldiha and Brutang Conservation Reserve), two Tiger Reserves (Similipal and Satkosia), three Elephant Reserves (Mayurbhanj, Mahanadi and Sambalpur), one Biosphere Reserve (Similipal) for addressing In-Situ conservation of wildlife (Plate 3 & 6). The Protected areas are situated in Eastern Plateau and Chhota-Nagpur province of Deccan Peninsula Bio-geographic zone and Eastern Coast Province of Coasts Bio-geographic zone (Wildlife Odisha 2023). The State has 10 Zoos, out of which one Large Zoo (Nandankanan), three Small Zoos and six Mini Zoos have been established to take care of Ex-Situ conservation of animals. All the zoos are operated as per the Zoo Master Plan approved by the Central Zoo Authority, Government of India. The State Botanical Garden which aims to conserve flora is also under the control of Wildlife Wing and is managed by the Deputy Director, Nandankanan Zoological Park.

Odisha has total coast line of 480 kilometres which is very rich and home to preferred habitats of marine and estuarine flora and fauna. The State is blessed with special habitat like costal sand dunes, tidal mudflats, sea grass beds and salt marshes. The State has the singular distinction of having three stretches of mass nesting beaches of endangered Olive Ridley Sea turtles including the world's largest nesting ground of Olive Ridley Sea turtle (Lepidochelys olivacea) at Gahirmatha, Rushikulya and Devi rookeries.

The state also attracts massive migratory bird populations which serves as their wintering grounds, prominent of which are Chilika (the largest wetland of Asia), Bhitarkanika along with Satkosia gorge, Ansupa, Hirakud Reservoir, Tampara lake all with "Ramsar Sites" Status (Plate 4). The state has 8 important bird areas (1BAs) (Plate 5).

Besides, there are 4 crocodilian research and conservation centres in the state, viz for Gharial in Tikarpada (Satkosia), Saltwater crocodile in Dangmal (Bhitarkanika), Mugger in Ramtirtha (Similipal) and captive breeding programme of all three Indian crocodilian species in Nandankanan Zoological Park respectively.

Further, so far 49 Ecotourism destinations have been developed with Eco-cottages and Tents for accommodating 1250 eco-tourists for night stay. The entire management is through community participation and the revenue generated is also ploughed back in full for further development of the sites besides supplementing the income of the community.

As of now, 539 nos. of EDC have been formed covering 43455.32 ha. of protected area; and people's participation plays a major role in conservation of wildlife.

1.2 The Wildlife Diversity of Odisha

The wildlife diversity of the state comprising of mammals, birds, reptiles, amphibians, fishes and a large variety of invertebrates, play a very important part in maintaining the balance of the eco-system. Each species has its own place and play its own role in the complex interaction of food-chains & food-webs. Intact forests with thriving wildlife are needed for smooth functioning of biogeochemical cycles, prevention of floods and soil erosion as well for efficient functioning of the water cycle.

The state is habitat for over 5174 species of plants and fungi including 2800 species of higher plants

together with 300 species of grasses, 153 species of orchids, 178 species of pteridophytes, 22 species of gymnosperms, 63 species of mangroves and their associates, 24 species of seaweeds, 7 species of seagrasses, 17 species of carnivorous plants. About 300 species of bryophytes, 275 species of lichens, and above 1000 species of fresh, marine, and brackish water algae contributes to cryptogam diversity. Thirty species of wild edible mushrooms and above 450 species of macro-fungi, 300 species of wild relatives of crop plants, and 500 species of medicinal plants also occur in Odisha. Around 117 plant species including 41 medicinal plant species of the state are considered as threatened and 24 species are endemic to Odisha, out of it 7 species each are orchids and grasses. The biogeographic zones support a large diversity of animals. The faunal resources comprise 114 species of Mammals (103 wild and 11 domestic), 537 species of Birds, 131 species of Reptiles including 3 crocodilian species, 29 species of Amphibians, about 800 species of Pisces, 584 species of Crustaceans, 366 species of Molluscs, 259 species of Coleoptera, 98 species of Diptera, 265 species of Hymenoptera, 112 species of Spider, about 300 species of Lepidoptera, 102 species of Odonata and 31 species of Isopteran. A total of 65 globally threatened faunal species are reported to occur in the state which includes 26 species of birds, 20 species of mammals, 18 species of reptiles, and one species of fish (Odisha Biodiversity Board).

The state has wildlife wealth of various animal life and iconic species of wild animals such as Elephant, Tiger, Leopard, Dolphin, Hyena, Wolf, Fishing Cat, Leopard Cat, Jungle Cat, Gaur, Sambar, Blackbuck, Spotted Deer, Wild pig, Giant squirrel, Pea Fowl, Hill Myna, Salt water Crocodile, Marsh Crocodile, Gharial, King Cobra, various Sea turtles, Monitor lizard etc.

Government of Odisha has notified four Biodiversity Heritage Sites (BHS) i.e. Mandasaru Hills, Kandhamal district, Mahendragiri Hills, Gajpati district, Gandhamardan Hills in the Bolangir and Bargarh district and Gupteswar forest in Koraput district.

1.3 The State Icons of Odisha

State Tree: Kadamba (*Neolamarckia cadamba*)

State Flower: Ashoka (*Saraca indica*)

State Animal: Sambar (*Rusa unicolor*)

State Bird: Indian Roller (*Coracias benghalensis*)

1.4 Threats to wildlife conservation

Although the state has extensive Protected Area network for wildlife conservation and protection, it still faces several challenges. These include habitat degradation, fragmentation and shrinkage due to various reasons, increased man-animal conflicts, proliferation of invasive species, poaching, and impacts of climate change. There is an explicit need for ensuring better protection of wildlife outside the protected areas and initiating recovery programs to save threatened species and their habitats.

1.5 Causes and effects of threats to wildlife in Odisha

The major three identified key threats are Habitat fragmentation and deterioration, Human-wildlife conflict and Loss of wildlife.

Plate 1: Location map of Odisha

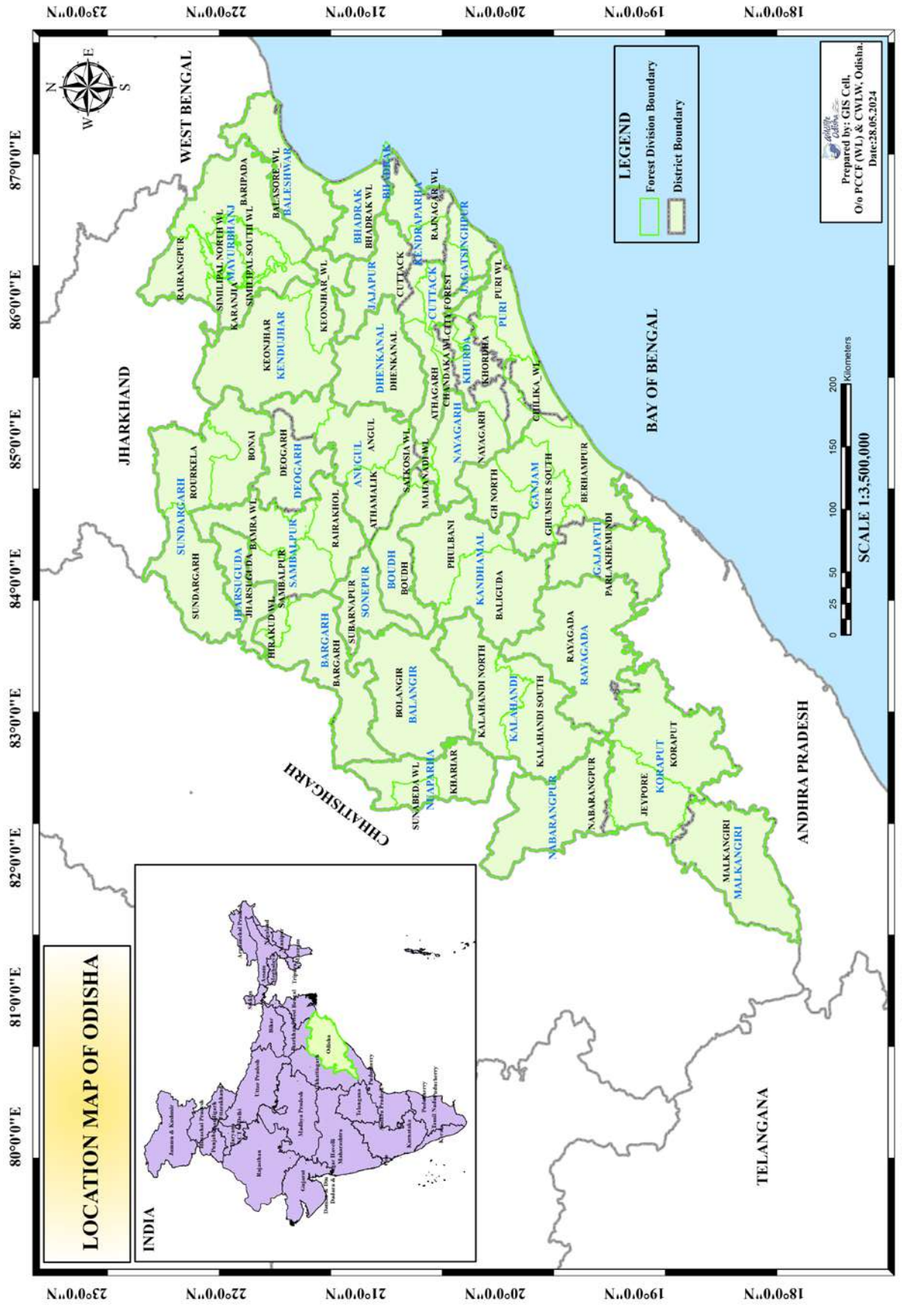


Plate 2: Forest cover map of Odisha-2021

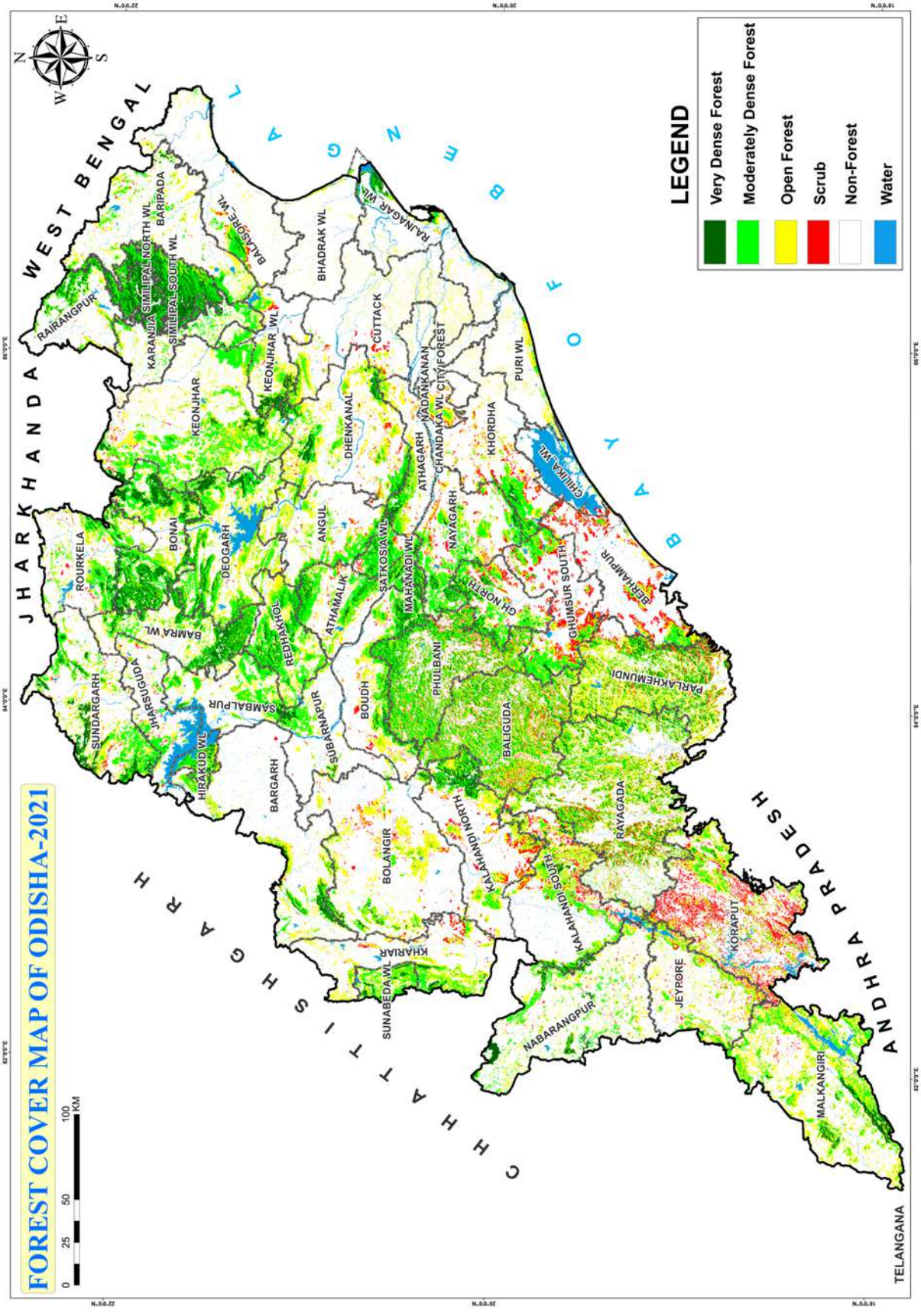


Plate 3: Map of Sanctuaries, National park and conservation reserves in Odisha

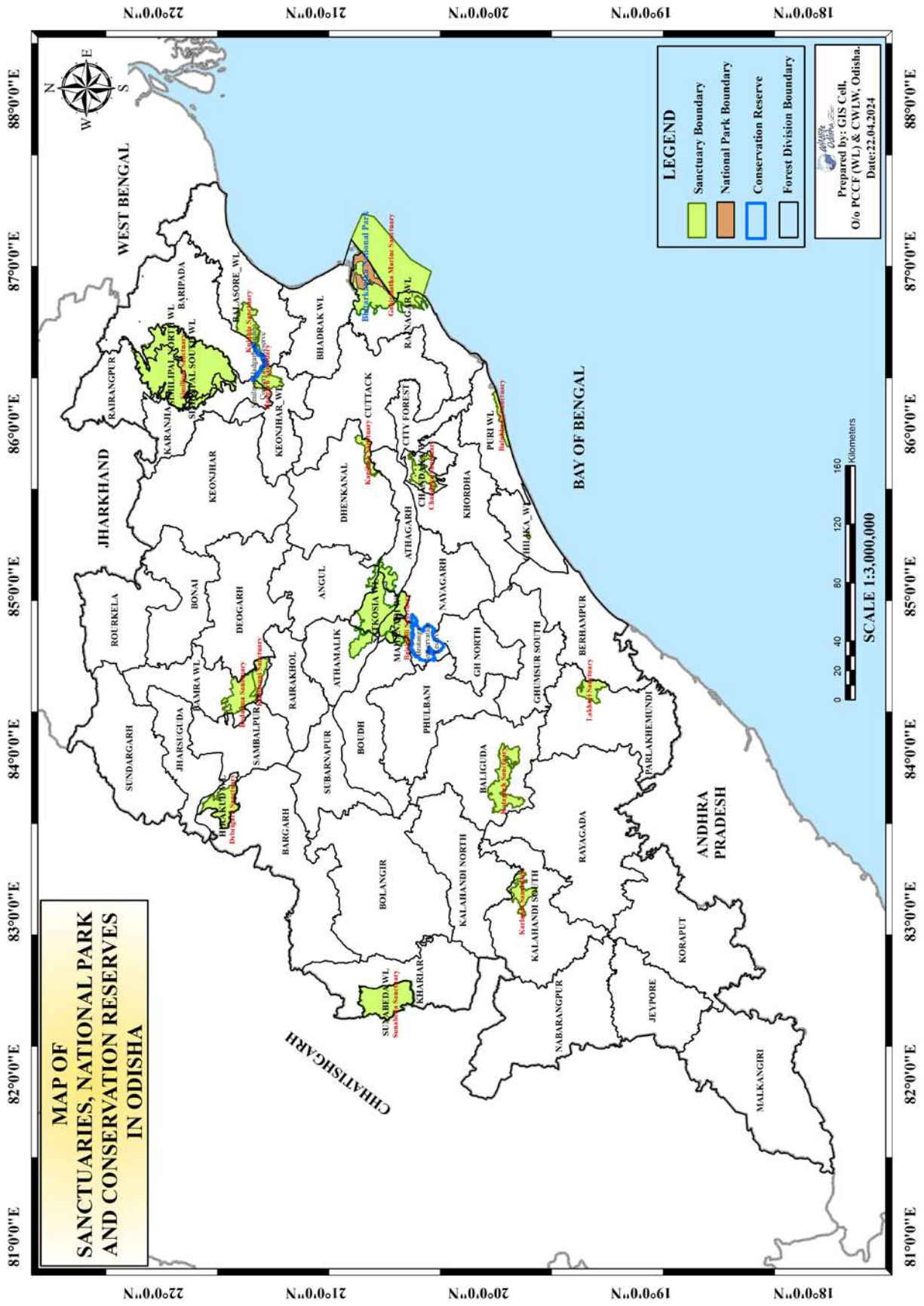


Plate 4: Map of ramsar sites in Odisha

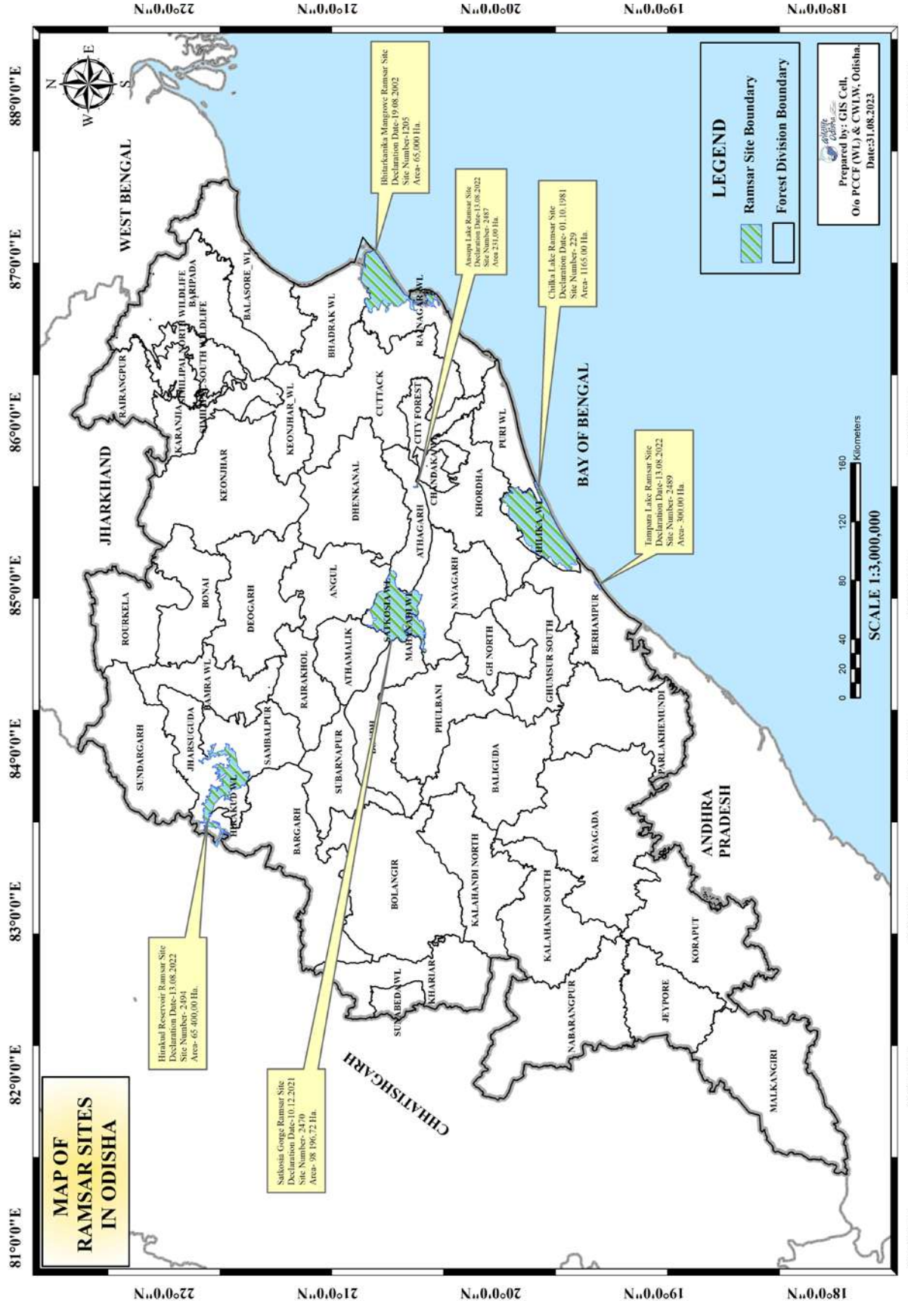


Plate 5: Map of important bird areas in Odisha

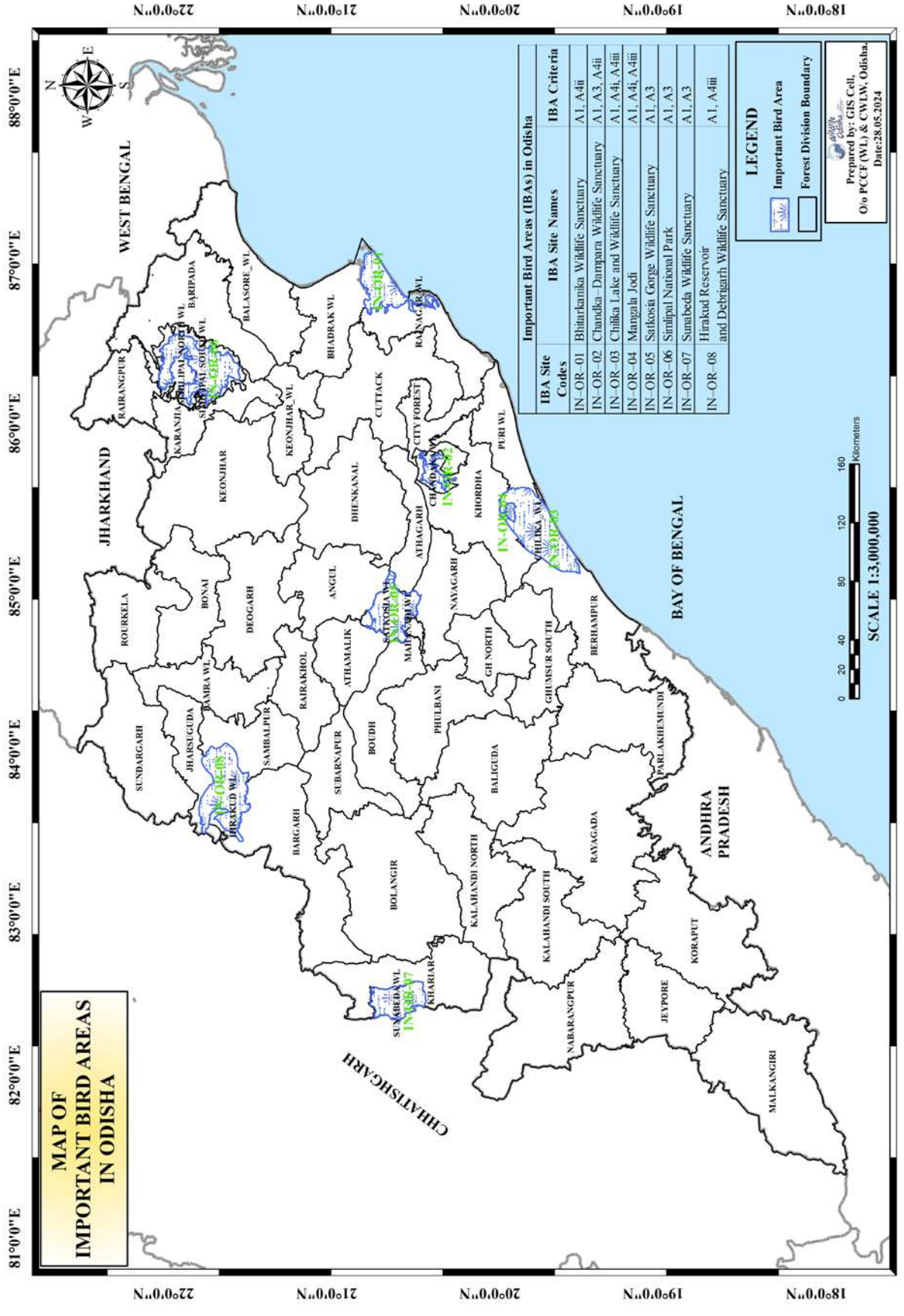


Plate 6: Map of elephant reserves and tiger reserves in Odisha

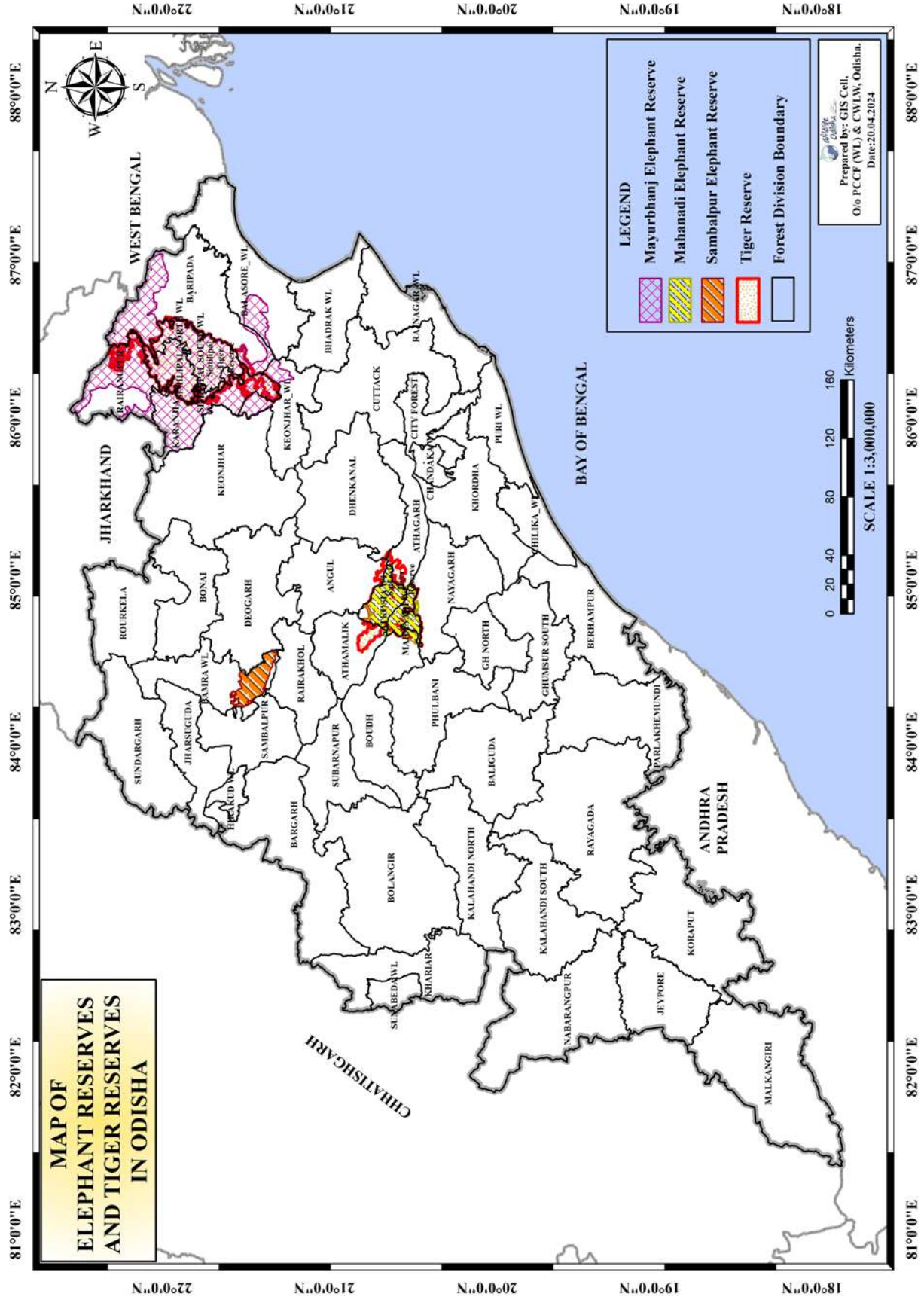
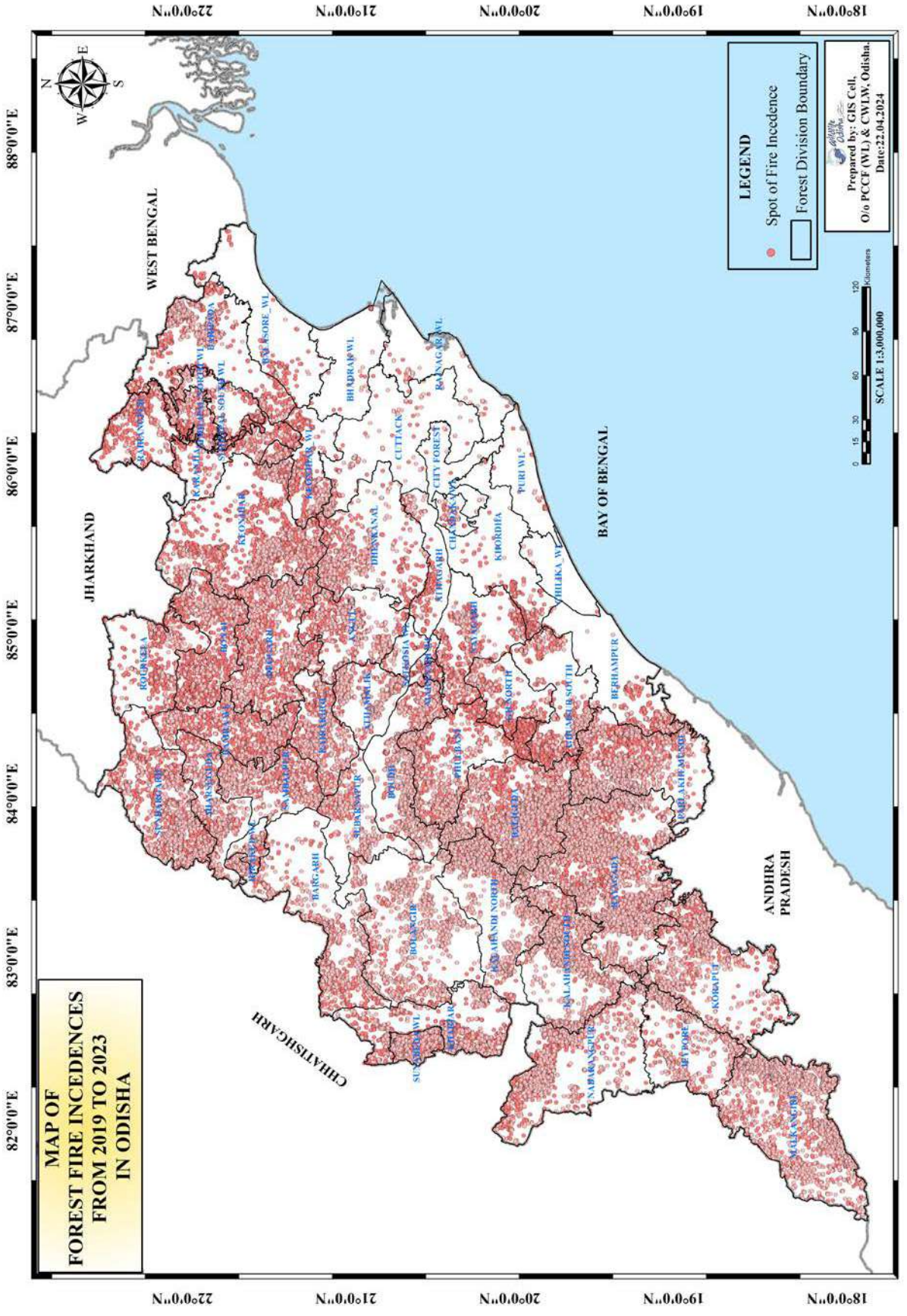


Plate 7: Map of forest fire incedences from 2019 to 2023 in Odisha



Key Threats	Contributing Factors	Effects
Habitat fragmentation and deterioration	• Land-use change due to development of infrastructure, agriculture expansion and expansion of human habitation • Mining and associated activities Linear infrastructure development, such as power line, rail and road • Extreme forest fire	• Human-wildlife conflict leading to loss of human life and property, leading to negative attitude of people towards wildlife and increased cost of wildlife management • Loss of habitat and species severely costing to biodiversity
Human-wildlife conflict	• Habitat fragmentation creating more edges for negative interactions • Human population pressure on natural habitats leading to habitat deterioration in terms of shortage of natural food for wildlife • Inadequate capacity of the forest department to deal with emergencies due to human-wildlife conflict	• Loss of property and human life resulting into negative attitude of people towards wildlife and. • Locals more vulnerable to poverty • Negative interaction with wildlife causes low tolerance towards many species, which triggers retaliatory killing leading to biodiversity loss.
Loss of wildlife	• Land-use changes resulting to habitat loss • Hunting of wildlife and unsustainable fishery for economic benefits and as a cultural practice • Inadequate protection and enforcement	• Ecological imbalance leading to loss of ecosystem services • Loss of biodiversity • Loss of natural and cultural heritage

The state has a human population of about 41.97 million with a density of 270 humans per km2 (2011 census). Livestock resources comprise of about 18.17 million heads (as per 20th livestock census provisional report). Increasing human population, expansion of settlements, and ensuing development activities (mining, industry, railways, etc.) have increasingly caused degradation and fragmentation of wildlife habitats across the state leading to isolation of wildlife populations and increased interface with humans. This could be the key reason on increase in human-wildlife conflict, especially with elephants, tigers, sloth bears and at times, crocodiles.

Over 793 people in the state have lost their life due to wild animals and about Rs. 27.10 cores have been paid as ex-gratia support for human death during April 2018 to March 2023. In the same period, the government paid about Rs. 4.26 crores for human injury, Rs. 69.9 crores for crop depredation, Rs. 5.11 crores for house damage and Rs. 0.24 crores for cattle kill by wild animals.

Negative interactions between sloth bear and human are quite common in the state. The state is blessed with rich deposits of minerals like coal, bauxite, chromite, iron ore, manganese ore, dolomite, limestone and mineral sands. The chromite, nickel, bauxite ore and coal deposits constitute 97.9%, 92.5%, 51.0%, and 33.2% respectively of the total deposits of the country. While mining activities commenced more than 100 years back, there has been unprecedented growth in recent times, particularly in bauxite, chromite, iron ore and coal (Odisha Climate Change Action Plan, 2018). Most of the mineral deposits are located in the forest areas and mining in these areas has resulted in irreversible damage to the wildlife habitat (shrinkage, fragmentation and degradation). Operational activities and blasting of rocks affect animal behaviour and ecology. This also leads to air and water pollution and at times social impacts

(displacement and rehabilitation) affecting overall dynamics of the region and wildlife conservation.

Mining activities have fragmented wildlife habitats, especially in Keonjhar, Bonai, Dhenkanal, Angul and Rairangpur-Karanjia landscape (Plate 9). Coupled with encroachment and monoculture plantation, mining has led to shrinkage and degradation of elephant and other wildlife habitats and resulted in increased human-wildlife conflicts (Plate 10).

The mangroves all along the Odisha coast are threatened due to high density of human populations in these areas and competing demand for fuel wood, land for agriculture and commercial prawn farming. Large scale vessel movement and fishing, development of ports, strong illumination along nesting beaches, loss or modification of the nesting beaches, predation of eggs have posed threats to turtle populations.

Linear developments like railway line, irrigation canal and roads have further fragmented the wildlife habitat. The Rengali dam constructed across Brahmani River in Rengali village (Angul district) and the two irrigation canals aimed towards agricultural prosperity of the state has severely fragmented the wildlife habitat in north of Mahanadi River. On one hand this has facilitated cultivation in areas not earlier favorable to agriculture, and on the other, has created physical barriers for animal movement, especially for larger mammals like elephants - leading to their more encounters with humans, especially in Dhenkanal and Angul districts (Plate 8). Study conducted by Indian Institute of Minerals and Materials Technology (IMMT) and Spatial Planning and Analysis Research Centre Private Limited (SPARC) suggested that the mangrove ecosystem may get adversely affected due to reduced flow of fresh water.

Electrocution: 77 elephants have died due to electrocution in last five years from April 2018 to March 2023, majority of them have been cases of deliberate electrocution mostly due to trap laid for bush meat from 11 KV lines, charging of crop fence from LT lines/homestead connections. Most of the accidental electrocution deaths is by low-hanging power lines.

Odisha has lost about 18 elephants to train hit and 4 animals to road accident in the last 5 years, the figure are decreasing due to timely intervention and concomitant monitoring of elephant herds.

Poaching of elephant for ivory, tigers for skin, bones and claws, sloth bears for gall bladder and many other wildlife are another major challenge to wildlife conservation in the state. In the last five years, 17 elephants have fallen prey to poaching.

Presently, wildlife in the state is managed by the state forest department but the management is largely confined to the protected areas that are mandated to be operated on prescriptions provided in a time-bound management plan. In the year 2022, for the protection of wildlife including elephants in the state, Joint Task Force (JTF) was constituted by the Forest Environment & Climate Change Department, pursuant to the Order of the Hon'ble High Court of Orissa involving Forest staff, police personnel, scientific groups/ eminent wildlife experts and civil society members. Comprehensive Action Plan is prepared by Joint Task Force for Conservation of Elephants & Mitigation of Human-Elephant Conflict in Odisha which is in details elaborated in paragraph 1.9 of this chapter.

Thus, a holistic approach to secure the future of wildlife in the state is necessary. The approach should spell out strategies to reduce or eliminate the threats outlined above so that wildlife and their habitats both within and outside the PA network are managed effectively.

Plate 8: Map of elephant movement in Odisha

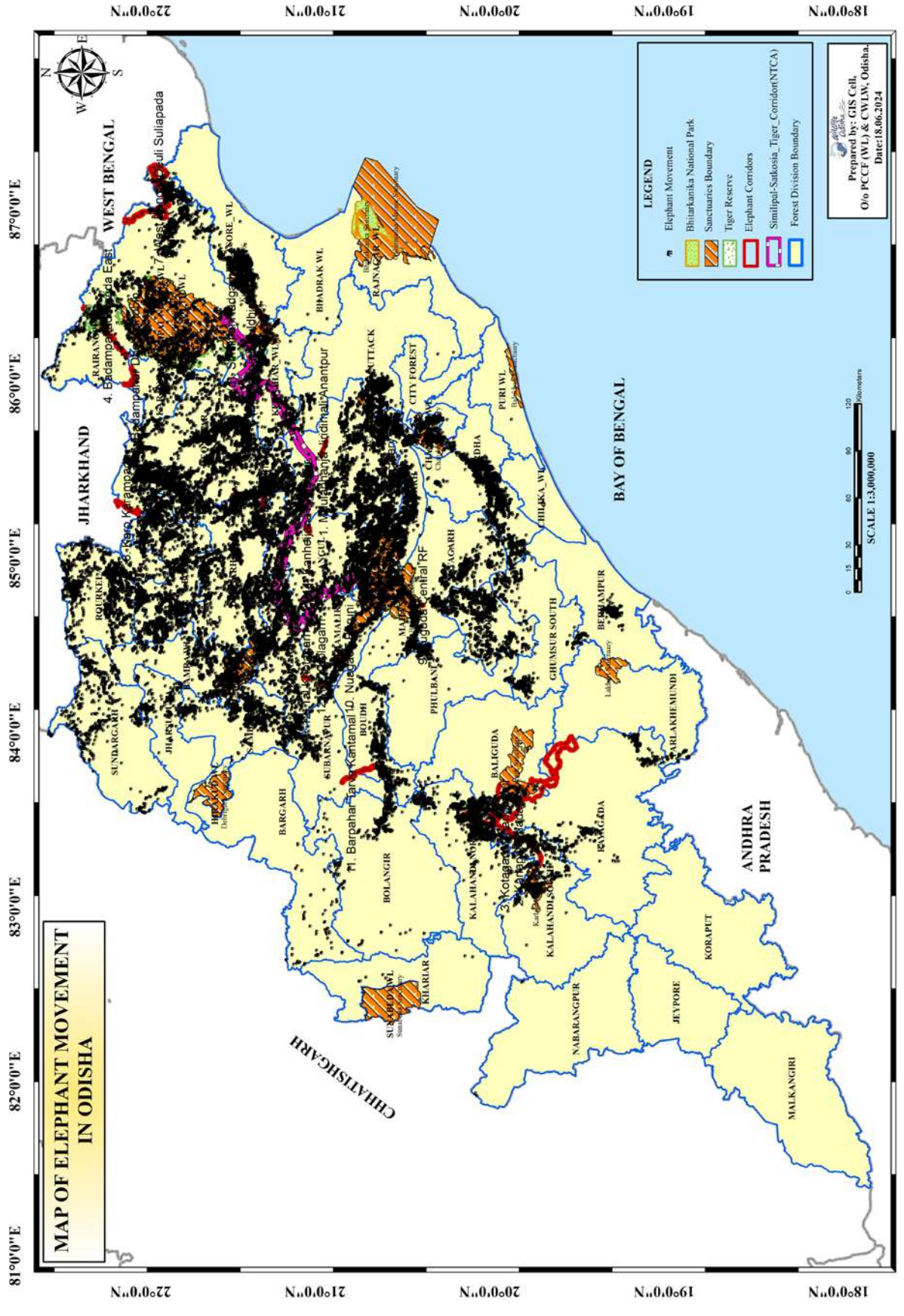


Plate 9: Mineral map of Odisha

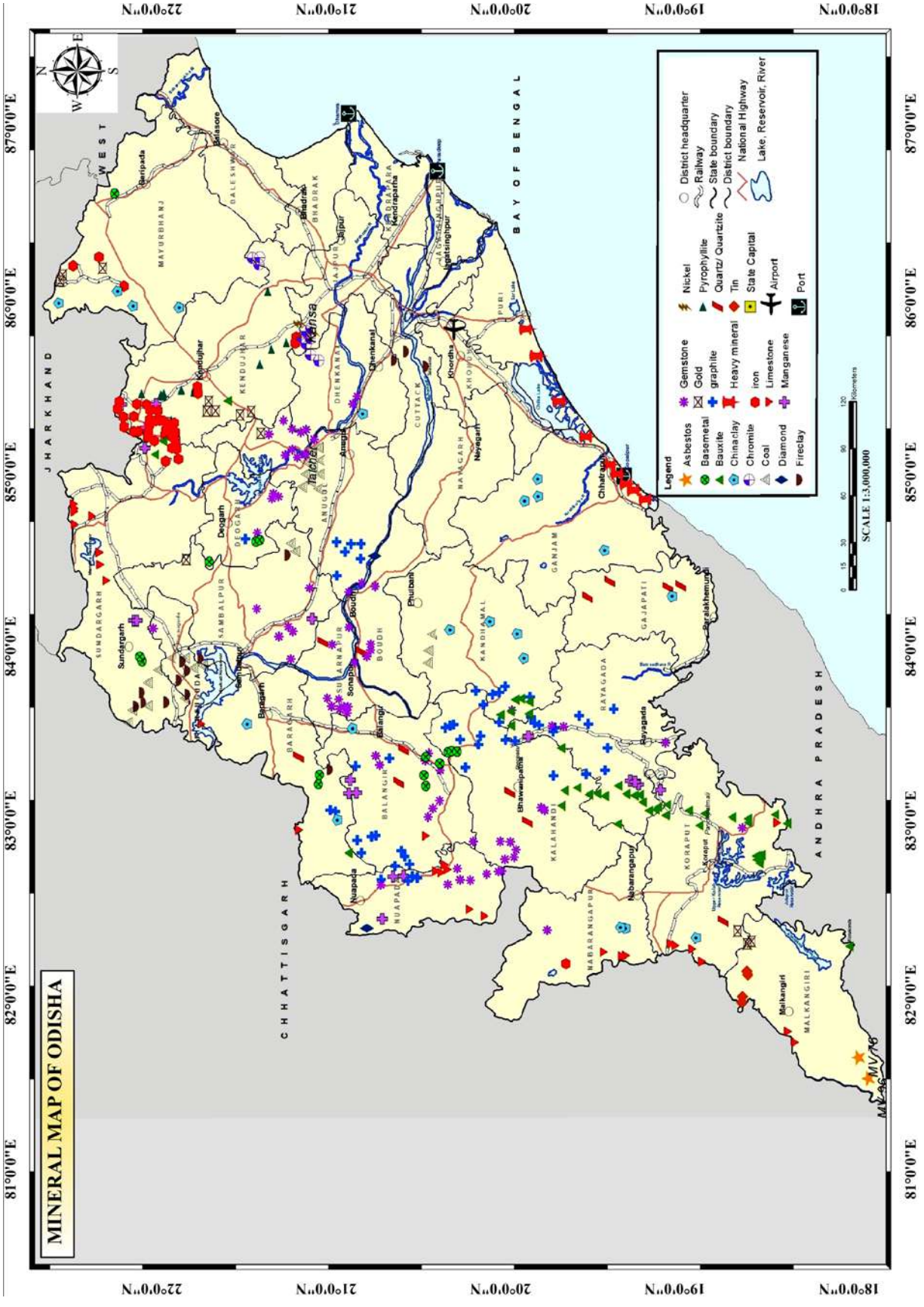
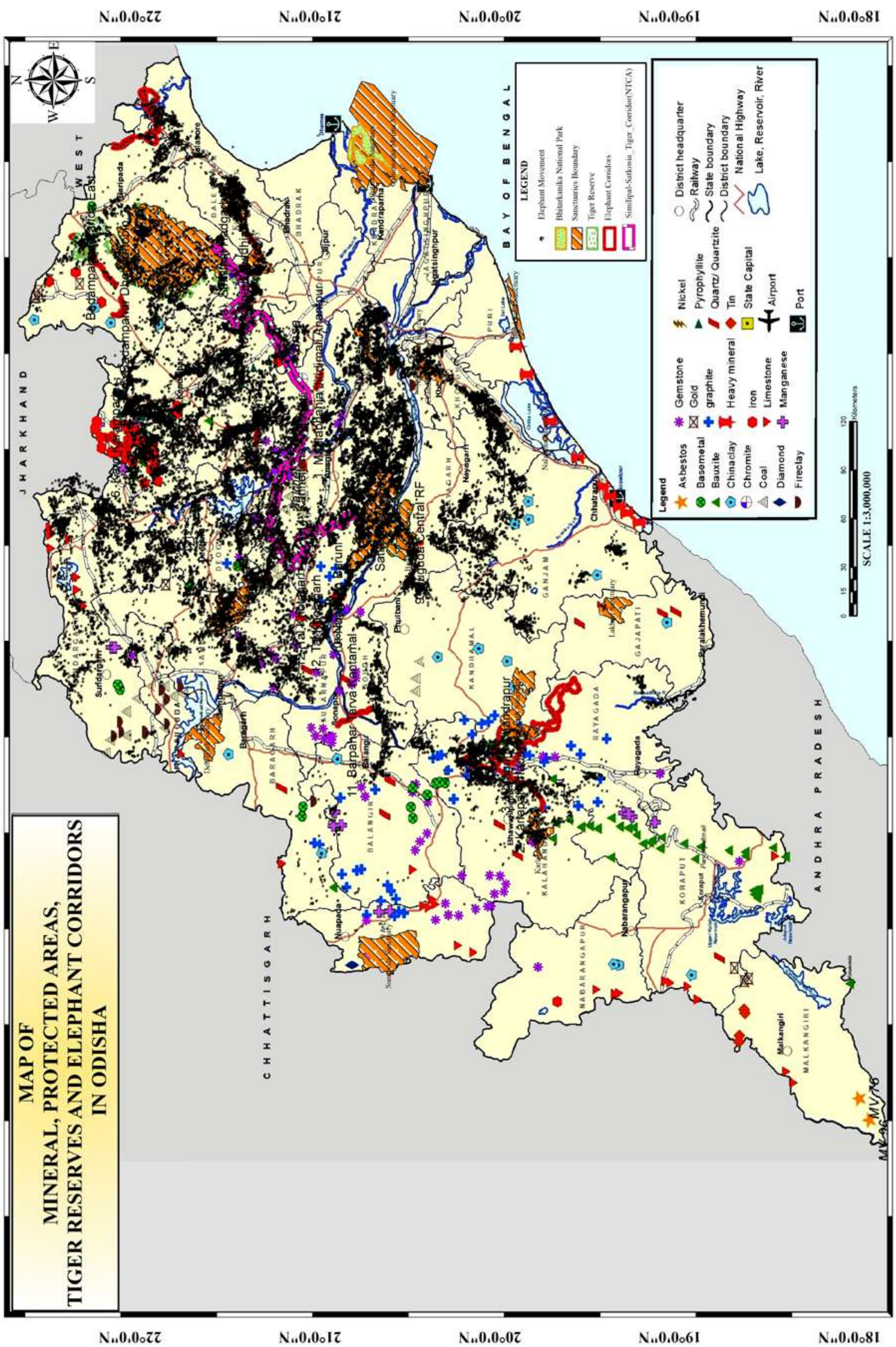


Plate 10: Map of mineral, protected areas, tiger reserves and elephant corridors in Odisha



1.6 Background of Regional Wildlife Management Plan (RWLMP)

The State of Odisha is rich in natural resources. The major mining projects have a larger impact on the environmental parameters and are more hazardous in terms of the after effect they have on various ecological resources and ecosystem services. Hence, to mitigate the environmental impact as well as the impact on wildlife there is a need for Regional Wildlife Management Plan (RWLMP) apart from existing Site-Specific Wildlife Management Plan (SSWLMP) because the mitigation measures under SSWLMP are limited only to zone of influence which largely offsets the adverse impacts of non-forestry projects in the impact area/ core area and adjoining area in its vicinity. On the other hand, the mitigative measures being executed under RWLMP seeks to operate at landscape level to address the negative effects of mining activities.

The State Government have imposed condition for contribution to the Regional Wildlife Management Fund at applicable cost norms to mitigate the impact of mining on Wildlife Resources of the State. The cost norm for contribution to the Regional Wildlife Management Fund varies with change in the minimum wage rate per man- day. As on 30.09.2023 an amount of 372.93 crore has already been deposited by the user agencies.

Earlier the Forest, Environment and Climate Change Department, Government of Odisha in their O.O. No.64/F&E dt 01.01.2014 have constituted a Technical Advisory Committee under the chairmanship of PCCF (WL) & CWLW, Odisha for empaneling suitable individual/firms for ensuring preparation of good quality "Regional Wildlife Management Plan" and "Site Specific Wildlife Management Plan" in a time bound manner following which the State Government accorded approval for preparation of a Comprehensive Wildlife Management Plan for the whole State by Wildlife Trust of India and WTI delivered the OSCOW-MAG documents on 25.01.2021 with plan outlay of 4600 crore for 10 years.

As on 30.06.2024 a total 386.82 crore (Table 1.6.1) has been deposited by the user agencies from primary mining areas of 16 divisions. Secondly, the interventions suggested are of broad nature and keeping in mind these prescriptions the field level actions need to be decided. Therefore, keeping in view, the resources available, areas for interventions are to be prioritized and the specific interventions (as per general prescription given by WTI) need to be decided for implementation of the guidelines.

To address this, it was suggested to Government that the circles from where this amount is collected shall be considered as area of operation. Mainly, areas covering in and around the divisions affected by such mining with some other important wildlife movement areas (to facilitate safe passage) of the circle shall be targeted. Secondly, to decide on the specific interventions constitution of a committee was proposed.

Further it was decided that RCCF of the concerned circle shall formulate proposals based on OSCOW-MAG by 30th April of the year prior to year of APO and the same shall be submitted to Member convenor of the Committee. The committee shall consider the proposals received in a meeting and if found appropriate, then shall recommend the same to PCCF (WL) & CWLW, Odisha with all details like physical, financial outlays and location, etc. The PCCF (WL) & CWLW, Odisha shall consider the recommendation of the committee and shall include the same in CAMPA APO of next year to the extent possible. This process also seemed to be limited to one APO without having perspective of long-term plan for mitigation of the impact on wildlife.

Meanwhile Comprehensive Action Plan (CAP) was submitted before the Hon'ble High Court of Orissa for conservation of elephants & mitigation of human-elephant conflict in Odisha prepared with 10 broad thematic pillar strategy with 194 actionable points by the Joint Task Force (JTF) constituted on 13.09.2022 vide No. FE-WL-CASE-0009-2022/16368/FE & CC pursuant to the Order dated 08.08.2022 and

Order dated 25.08.2022 and re-iterated vide Order dated 15.11.2022 of the Hon'ble High Court of Orissa passed in W.P.(C) PIL No. 14706 of 2022 (Gita Rout vrs. State of Odisha and Others).

Further it felt necessary to go for a long-term Regional Wildlife Management Plan (RWLMP) for a period of 10 years by consulting the broad points of "Comprehensive Management Guidelines" of OSCOW-MAG, recommendation of "Comprehensive Action Plan (CAP)" and thorough SWOT analysis for the all the 51 divisions for the whole state of Odisha. The financial outlay for this plan is 696 crores for the 10 years and the same is proposed in 10 Annual Plan of Operation individual for all the 51 divisions aiming at providing long term mitigative approach to the biodiverse wildlife of the state of Odisha.

Table: 1.6.1 Year wise Abstract of Deposit of RWLMP & SSWLCP from 2006-07 to June 2024

Sl. No	Year	RWLMP (in Rs.)	SSWLCP (in Rs.)	Total (IWLMP) (in Rs.)	Remarks
1	2006-07	93758044	16071885	109829929	Reconciled with MOEF & CC
2	2007-08	68536850	0	68536850	Reconciled with MOEF & CC
3	2008-09	554198669	32506912	586705581	Reconciled with MOEF & CC
4	2009-10	82027295	413600000	495627295	Reconciled with MOEF & CC
5	2010-11	357589856	372138533	729728389	Reconciled with MOEF & CC
6	2011-12	197715238	229918113	427633351	Reconciled with MOEF & CC
7	2012-13	98737895	271719000	370456895	Reconciled with MOEF & CC
8	2013-14	481973704	945276857	1427250561	Reconciled With MOEF & CC
9	2014-15	308768683	768969307	1077737990	Reconciled With MOEF & CC
10	2015-16	264724307	555506840	820231147	Reconciled With MOEF & CC
11	2016-17	6503945	167453500	173957445	Reconciled With MOEF & CC
12	2017-18	238808109	812222700	1051030809	Reconciled With MOEF & CC
13	2018-19	220249074	982730300	1202979374	Reconciled With MOEF & CC
14	2019-20	194315890	1008958780	1203274670	Reconciled With MOEF & CC
15	2020-21	135894500	361025100	496919600	Reconciled With MOEF & CC
16	2021-22	338816248	1716939058	2055755306	Reconciled With MOEF & CC
17	2022-23	75892402	1386079658	1461972060	Not Reconciled
18	2023-24	148378124	903651500	1052029624	Not Reconciled
19	April 2024-June 2024	1365560	-	-	-
	Grand Total	**3868254393**	**10944768043**	**14811656876**	

1.7 Odisha State Comprehensive Wildlife Management Guidelines (OSCOW-MAG)

The Odisha State Comprehensive Wildlife Management Guidelines (OSCOW-MAG) was prepared by Wildlife Trust of India (WTI) for the whole state of Odisha the OSCOW-MAG which specifically suggested broad based generic prescriptions for State level, Circle level as well as for the division level. The broad key points suggested in OSCOW-MAG is discussed below.

1.7.1 Objectives of the comprehensive wildlife management guidelines

Taking into consideration the threats faced by wildlife in the state, gaps in wildlife conservation and management measures and state's vision for wildlife conservation, the WTI project has developed the comprehensive wildlife management guidelines at three levels- Forest Division, Forest Circle and a State level guidance document. Whereas the state level guidelines would be the guiding document for determining policy and programs, the Forest Circle and Division level guidance would form the operational part of the document. These shall need to be merged with the existing PA management plans. The framework of wildlife management guidance primarily includes;

a. Identification and mapping of key biological resources and their connectivity across the landscape.

b. Identification and restoration of degraded or lost habitats essential for animal persistence and movement.

c. Reduction in animal mortality by humans by reducing wild animal – human conflicts, mitigating animal mortality due to train hits, reducing deliberate and targeted killing of wild animals and by electrocution.

d. Promoting conservation of wildlife at the grassroots level by involving and strengthening of local level institutions and citizen groups.

e. Optimizing manpower and infrastructure requirements of the state to allow for prevention of wildlife crime and better prosecution.

The wildlife management guidance outlined for the state are in tandem with the management plan of all Protected Areas and covers all Forest Divisions of the state.

The "State Level Policy and Program Guidelines for Comprehensive Wildlife Management in Odisha" is a state level generic guideline, which presented thoughts for policy level interventions and enrichment of conservation actions for better management of species and their habitat as well.

The suggested policy and program guidance have been divided into 10 major generic umbrella schemes which are as under:

1. *Species specific management programs*
2. *Rationalizing protected area network in Odisha*
3. *Eco restoration Program*
4. *Ex-situ In-situ Integration Program*
5. *5. Capacity enhancement*
6. *Human wildlife conflict management*
7. *Wildlife protection enforcement*
8. *Trans boundary wildlife management and coordination*
9. *Research and monitoring*
10. *Education and Awareness*

Each of these suggested schemes were explained as per their broad vision and suggestions.

1.7.2 Species- specific wildlife management umbrella program

The broad scheme focused about multi-species-specific management programme of wild animals for the Odisha Forest Department. The suggested programme also covers a range of animals for which management actions have been suggested. Odisha's multiple habitat types, such as sea coast, rivers, lakes, forests and grasslands are represented by carnivores, large herbivores, bovids, snakes, birds and many other wild animals. The programme also suggested multiple species ranging from turtle, elephant, tiger, crocodile, dolphin, blackbuck, sloth bear, horse-shoe crab, India skimmer and others that require site specific management interventions for their conservation.

Under species- specific wildlife management umbrella program eleven specific recommendations under OSCOW-MAG was proposed and the broad action points for each animal were described as under;

1.7.2.1 Enhancing Tiger Reserves for a healthy tiger Population in the state

Odisha has two tiger reserves - Similipal and Satkosia and possibility of a third reserve at Sunabeda is

being examined. The Similpal TR after passing through a period of left- wing extremism driven turmoil and Akhand shikar by tribal is slowly bouncing back to its former management regime. The Satkosia TR seems to have problems of connectivity with adjoining good tiger habitats and absence of a good source population. The OSCOW-MAG recommends the following for improved tiger conservation in the state.

i. Fasten the process of setting up of Sunabada Tiger reserve

ii. Expansion of Satkosia Tiger Reserve with the inclusion of Balunga RF, Nuakhet RF, Krushnachuda PRF and Burti PRF.

iii. Identifying, restoring and managing tiger corridors between two tiger reserves and the forested areas

iv. Identifying and setting in place a sound protection plan for source tiger population in Similipal, Satkosia and Sunabada

v. Setting in motion the prospects of re-introduction of tigers in Satkosia TR with tigers relocated from State of Madhya Pradesh

1.7.2.2 Managing Elephant Population

The elephants in Odisha are part of the central population extending over 21000 km2 in the state of Odisha, Jharkand, Chattisgarh, southern West Bengal and partly to MP. In Odisha, elephants are distributed from north of Mahanadi River in Baripada, Karanjia, Keonjar, Bamra, Rairakhol, Angul, Dhenkanal, Athmalick, and Athagrh forest divisions to south of the Mahanadi River up to Boudh, Nayagarh, Phulbani, Baliguda, Kalahandi, Raigada, Parlakhemundi and Ghumsur North Forest Divisions. About 57% of the elephant habitat in central India lies within the administrative boundary of Odisha. As per the 2017 elephant census 1976 elephants are spread over about 11000 km2. Elephants occupy 44 out of 50 forest divisions of the state. Therefore, the future of the central Indian elephant population and habitat, which is one of the most fragmented and degraded, critically depends on actions by the state of Odisha. While the total number of elephant deaths in Odisha since 2010-11 is 590; 205 elephants have died due to unnatural reasons. The number of elephants electrocuted during the same period is estimated to be over 85 in number and more than 25 elephants have died due to train hit since 2011-12. Moreover, 461 human lives were lost in elephant related incidents and above Rs.7.5 crore has been paid by state government as ex-gratia support for human death caused by elephants between April 2009 and February 2017. During the same period Rs. 9.88 crores have also been paid for crop depredation by elephants.

Odisha state forest department has identified 14 elephant corridors/movement routes, of which four corridors are between Odisha and Jharkhand, the ecological status of most of these corridors requires a greater degree of monitoring for assessing the required restoration activities.

Linear infrastructure elements like railway lines, irrigation canals, and highways have further fragmented elephant habitats in Odisha. The Rengali dam constructed across the Brahmani River in Rengali village (Angul District) and the two irrigation canals aimed at improving the state's agricultural prosperity have severely fragmented the wildlife habitat to north of Mahanadi river of the state. The elephant habitat to the north of Mahanadi River (Mayurbhanj, Keonjhar, Bamra. Rairakhol, Angul, Dhenkanal, Athmallik, Bonai and Athgarh) are threatened by severe mining activities and expansion of human habitation. The elephant habitat south of Mahanadi River is threatened mainly due to loss of forest cover caused by shifting cultivation. The recommended actions for elephant conservation in Odisha are the following.

i. Launch a state level elephant conservation program "Project Airavat"

ii. Initiate actions to reduce human-elephant conflict (third highest in the country) and mortality of humans and elephants through appropriate education and awareness programs

iii. Launch and promote lure crop, avoidance crop and such other practices to decrease crop depredation by elephants

iv. Liaise with state electricity department for changing the transmission lines into insulated cables so as to minimize the illegal tapping of electricity for retaliatory killing.

v. Hasten the process of providing legal protection to the identified elephant corridors and develop restoration and management plans for each of the identified corridors

1.7.2.3 Crocodile population management in the state of Odisha

Odisha was the first state in the country to initiate conservation projects for all the three species of crocodilians found in the state and in India in the year 1975. Odisha Government has setup up crocodile rearing centres at Tikarpada in Angul forest division (for Gharials), at Dangmal in Bhitarkanika WLS (for salt water crocodile), Ramtirtha in Similipal TR (for Mugger crocodile) and a conservation breeding program for all the three species at Nandankanan Biological Park. From 1975 till now captive hatched and reared crocodilians have been reintroduced back into the wild in the state at many locations, with 600+ Gharials having been reintroduced into the Mahanadi in the Satkosia Sanctuary, over 2500 saltwater crocodiles in Bitharkanika WLS and a large number of muggers reintroduced back into the wild in Satkosia, Simlipal, Rengali and several other man-made reservoirs.

Currently, barring the Gharial, the saltwater crocodile and the mugger crocodile population in the state are faring extremely well, even to the extent that the saltwater crocodile in Bhitarkanika has created a human-crocodile conflict (HCC) situation.

In the state of Odisha, the HCC has been one of the focused attention area by the wildlife management authorities. The situation of HCC in the Bhitarkanika Wildlife Sanctuary warrants greater attention wherein the Odisha Forest Department has initiated the salt water crocodile conservation project. From an estimated population of 96 salt water crocodiles in 1976, by 2017 the population estimates have crossed over 1500 individuals. From an encounter rate of 0.87 individuals/km in 1976-77, it has gone up to over 10 individuals/km by 2017. In the limited aquatic area of Bhitarkanika, between 1975-76 to 2006-07 (32 years) there has been seventy-two (72) instances of attack on humans by salt water crocodiles. Of these, between 1975-76 to 1994-95 (20 years) the HCC cases were only six and from 1994-95 to 2006-07 (12 years) the cases have been increased to 66, of which 30 were casualties and 36 were injuries to human being. The HCC cases from 2007-08 to 2017-18 needs to be analyzed to see the seasonality and annual trend of HCC in this target location.

The case of HCC with respect to mugger crocodile in Odisha has been very low. The mugger crocodile has been re-introduced in many reservoirs in south and western Odisha, particularly in man-made reservoirs where fisheries department manages and lease out the area for fishing. Though not many cases of HCC have been reported from these areas, the concerned forest divisions (Berhampur, Ghumsur South and Koraput) report increase in mugger populations in the water bodies. Thus, regular population monitoring is recommended besides putting up warning signage to avoid possible HCC cases.

However, the long-snouted Gharial is adapted to be a fish-eater (sometime predating on aquatic birds) and is not reported to attack on livestock and human beings. Though the historical literature records human limbs etc. in the stomach content of large Gharial killed in the Ganges and other rivers which is attributed to be the behavior of all crocodilians to be scavenging on dead and rotten carcasses.

The recommended actions for crocodile conservation in Odisha are the following.

i. Revive the state gharial ex-situ conservation and rehabilitation project to reorient and develop an appropriate in-situ and ex-situ link program that will help re-establish gharial in the Mahanadi River

basin (recently gharial has been re-established in Ganges through a reintroduction programme and a similar program is in progress in the Indus). Reintroduction attempts in Mahanadi River have not fared well. In demands for identification of causes and possibly a reintroduction program in the upper reaches of the Mahanadi River be initiated.

ii. Place a moratorium on further re-introduction of salt water crocodile in Bhitarkanika Wildlife Sanctuary as the population densities of the highly territorial species in the limited suitable habitat has reached beyond its carrying capacity resulting in enhanced HCC situation.

iii. The state government needs to set in motion a "Nuisance Crocodile Management Programme" in which identified habitual and repeated offending crocodiles are translocated to other location as quickly as possible.

iv. To facilitate abovementioned actions a specially trained "Emergency Response Team" consisting of an officer not below the rank of an Assistant Conservator of Forest (ACF), a qualified veterinarian and a minimum of five to six trained support staff be formed and should be provided with dedicated transport and other required infrastructures such as traps, nets, spotlights etc.

v. Many natural and man-made freshwater bodies in the state are inhabited by a large number of mugger crocodile; some of which are reintroduced population while others may be natural populations. Their presence and population level are in peaceful co-existence with surrounding human population at this point of time. A realistic assessment of their population status at the state level may be initiated to examine at how many of these sites a community involved possible crocodile-based ecotourism program can be initiated.

1.7.2.4 An action plan for conservation of Irrawaddy dolphins

The Irrawaddy dolphin (Orcaella brevirostris) inhabits in the Chilika lagoon; Asia's largest brackish water lagoon in the state of Odisha. In addition to Chilika lagoon, the species also occurs in the Bhitarkanika Wildlife Sanctuary and some other estuarine regions of coastal Odisha. In Chilika Lake, the Irrawaddy dolphins are found in the south and central sectors and the outer channel of the lagoon, ranging from the high salinity lagoon mouth to the much lesser saline region of the main lagoon with freshwater inputs. The Irrawaddy dolphin population have been monitored by the Chilika Development Authority since 2005 using multiple numbers of boats with observers conducting concurrent count in a single day. Between 2005 to 2017 the population of the Irrawaddy dolphins in Chilika has ranged from 105 to 158.

Dolphin based eco-tourism in Chilika was developed by the local people in the late 1980s and slowly developed into an alternate source of income for fisherfolk during the tourism season in winter months and also during the time when fish catches are minimal. The Chilika Developmental Authority (CDA) and state forest department have been supporting and helping maintain this locally developed industry while also raising awareness on the dolphin, and implementing boat operation guidelines amongst boat operators to reduce threats from boat strikes. However, annual boat strike mortalities of Irrawaddy dolphins are on the rise as a result of operation of larger number of boats for dolphin watch programme, perhaps beyond the carrying capacity.

Focused researches on Irrawaddy dolphin in Chilika have been conducted by Dr. Dipani Sutaria and Dr. Muntaz Khan and regular population monitoring exercises are on-going by CDA and the Chilika Wildlife Division. Other agencies such as WWF India, Wildlife Institute of India and IIT Delhi have also contributed to some degree of research information. Photo identification based on mark-recapture method was used by Dr. Sutaria during the November to April between 2004 and 2006 to estimate the Irrawaddy dolphin population in Chilika. The study estimated the total population size of the Irrawaddy dolphin in Chilika in 2006 between 109-112 individuals at CV=0.07 using an open-population model.

Mortality due to entanglement in fishing nets, deaths due to boat propeller hits, changes in salinity profile and changed habitat dependent distribution pattern into sub-optimal habitats and disturbance due to increased tourism pressure and boat engine noise resulting in altered distribution and behaviour pattern are the major threats for the Irrawaddy dolphin in the state. The recommended actions for the conservation of the species in Odisha are following;

i. Determine the carrying capacity of dolphin watch boats in the Chilika Lake: Currently, the dolphin-watch activities are largely restricted to Satapada, Balugaon, Rambha, Barkul and a couple of other locations. It has been cited in literature that over 200 boats were surrounding a social group of Irrawaddy dolphins in Satapada area during the Christmas holidays of 2016 and 2017. Even though, the CDA and the Chilika Wildlife Division have made dolphin watch guidelines, there exists no mechanism for penalizing boats for not following guidelines. In this background, it is recommended that all dolphin watch boats should be registered to enforce guidelines besides limiting the number of boats at each location.

ii. Dolphin tourism patrolling and policing unit(s) with suitable powers for prosecuting offender vessels be set in place. These units can be formed with the participation of the frontline forest department staff, representative of the fishing community, state tourism department and the Chilika Development Authority. Any repeat offending vessels must lose the right for operating a dolphin watch ecotourism vessel.

iii. Minimizing boats strike mortality in Chilika: All mortality of Irrawaddy dolphin be examined by a competent unit consisting of a veterinarian, a forest and wildlife staff and a voluntary representative of local fisher folks. Through this process all boat propeller strike injuries can be monitored and cause of mortality is established. This will also help identifying the hotspots of such mortalities in Chilika Lake thereby assisting management to keep in place appropriate measures to reduce the threat.

iv. Examine the feasibility of boat propeller guards that will reduce the propeller strikes with the Irrawaddy dolphins.

v. Promote "solar powered dolphin watch boat" both for noise reduction as well as reducing propeller strikes.

vi. Identify and assess the status of Irrawaddy dolphin population in other locations of Odisha in an attempt to defuse the tourism pressure from Chilika Lake to such other locations.

vii. Support and continue the Irrawaddy dolphin research and monitoring programme to be spearheaded by the CDA in collaboration with the Chilika Wildlife Division and the Rajnagar Wildlife Division.

1.7.2.5 Revisiting and revising the conservation action plan for the Olive Ridley Sea Turtles

Four species of sea turtles (Olive Ridely, Green, Hawksbill and Leatherback) have been reported in Odisha, though the nesting of only one species - the Olive Ridley (which is the most common species along the east coast of India) has been confirmed. Sea turtle conservation and management in Odisha dates back to mid-1970s after the Gahrimatha Turtle Rookery was made known to the world by H. Robert Bustard in 1976 to be the world's largest Olive Ridely mass nesting site. By 1994, two other mass nesting beaches of Olive Ridley Turtles, one at Devi River mouth and the other at the Rushikulya River mouth had also been discovered. Since mid-seventies till the present, there has been a cyclic reporting of mass nesting of over six to eight hundred thousand turtles nesting in some years and absolutely no

mass nesting of Olive Ridley in some other years along the Odisha coast. Over the years, the Devi river Rookery has continued to be supporting only an increased sporadic nesting, the Gahrimatha Rookery though continues to be a mass nesting site with much reduced and eroded nesting site availability, the Rushikulya Rookery has continued to be the most important nesting site for Olive Ridleys. In 2018, the Rushikulya Rookery has demonstrated mass nesting twice in the year.

Incidental capture of congregating breeding populations of sea turtles from the offshore waters of Bay of Bengal along the Odisha coast has contributed to almost three thousand to ten thousand turtles falling prey to this marine fisheries interface. Regular patrolling in the offshore waters by the forest and wildlife department also supported annually by the Indian Navy and Coast Guard has somewhat decreased this mortality. Other mechanism such as distribution of Turtle Excluder Devices (TED) for use in trawl nets have not resulted in much expected success as the fishers have rejected the use of TED on the ground that they also exclude commercially important fish.

Loss of nesting ground of turtles due to Casurina plantation along the coast as cyclone shelter belt, photo pollution and other chemical pollutions from ports and other developmental projects, occasional oil-spills from boats, coastal sand mining and increasing hydrocarbon exploration activities are some of the major threats to long-term conservation of the Olive Ridley turtles along the Odisha coast.

The declaration of the Gahirmatha Marine Sanctuary, seasonal no-fishing zones in the offshore waters off the Devi and Rushikulya River mouths to protect the offshore congregating turtles from mechanised and artisanal fishing has also alienated the local community from turtle conservation paradigm.

Traditional Monel metal tagging and satellite tagging is done to monitor the spatial use of the marine environment by turtles and their migration patterns. Such studies have shown the sea turtles using the coastal waters of Odisha from November-December to April-May after which they tend to migrate to the southern Sri Lankan waters. This has facilitated opening a window for developmental activities during May to October in the marine environment. However, this has not formally gone in to the planning process of the state government as also what needs to be done to safeguard the three Olive Ridley Rookeries from the threats of onshore and offshore developmental projects including large number of proposed and under development sea ports, coastal highways and such other linear development.

While the turtle arribada (mass nesting) is a spectacle of a life-time, as also the hatching of millions of baby turtles, this opportunity for developing an organized education awareness programme for marine turtles and community-based turtle tourism (as it exists elsewhere in the world) have been the lost opportunity along the Odisha coast. Since the turtle congregate and nest in the Common Property Resource regime where local communities and fisher folks had traditional rights, not involving and alienating the locals from turtle conservation and management does not bode well as far as societal participation goes. In this background the conservation actions and guideline recommended for turtle conservation are as follows:

i. Odisha being the only state in the country (and perhaps in the world) supporting almost half the global population of Olive Ridleys, it would be in the best interest of the state and the country to set up a "National Centre of Excellence for Turtle Research and Management" which will spearhead the annual plan of operation with respect to actions related to turtle conservation and management with the launching of a project "Operation Sea Turtle".

ii. Setting up of a "Community Involved and Managed State of Art Sea Turtle Interpretation Centre" at Rushikulya, looking at the advantage of easy access of visitors to the site (such a globally known

facility exists at Mon Repos Turtle Interpretation Centre, at Bundaberg in Queensland Australia, other examples are in Turtle island in Philippines and Indonesia).

iii. Consider establishing the "Rushikulya Rookery as a Community Involved and Managed Sea Turtle Rookery" within the provisions of the CRZ and Wildlife (Protection) Act, 1972 such as Conservation Reserve or a Community Reserve. This will also ensure safeguarding the Rushikulya Rookery from the adjoining detrimental developmental projects and will adhere to the recommendations of the Government of India's multi-sectoral expert committee that five kilometres of either side of the Rushikulya Rookery including the Rookery be declared as "No Development Zone".

iv. Urgently initiate a study to monitor the causes of the drastic erosion and loss of nesting beaches in the Gahirmatha Rookery where a WII and DRDO study has found that a 6-8 km long nesting beach has reduced to less than a kilometre.

v. Though Odisha has three mass arribada sites all along the coast of Odisha, there are several mini arribada sites which need to be monitored, identified and protected. These protected mini arribada sites can serve as centres of ecotourism destinations. With a proper management plan such location can provide opportunities for community involved infrastructure and livelihood options.

1.2.7.6 Developing a conservation action plan for Horseshoe Crab in Odisha

Despite their name, horseshoe crabs are not crabs at all. They belong to the phylum Arthropoda and class Merostomata of Animal Kingdom. Although, they are called "crabs" they are closer relatives to spiders (arachnids).

Of the four species of the Horseshoe crab known in the world, two species i.e. Tachypleus gigas (Müller, 1785) and Carcinoscorpius rotundicaudata (Latreille, 1802) were known to occur abundantly along the east coast of India. Interestingly, it is known by various names like Ram Lakkan Kankada, Ram Laxmania Kankada, Samudra Bichha and Belangkar in Odisha.

Based on the study findings and recommendation by National Institute of Oceanography (NIO), Goa and the Wildlife Institute of India (WII) on Horseshoe crab along the Odisha coast, all species occurring throughout Indian shoreline have been placed under the Schedule IV of the Wildlife (Protection) Act, 1972. Although IUCN Red List (Version 2.3) mentions T. gigas and C. rotundicauda as "Data Deficient" (WCMC, 1996) and CITES as "Not Evaluated".

The Odisha coast is reportedly home to the largest population of horseshoe crabs in India and the largest concentrations are known from Chandipur, Balaramgadi, Kasaphalo and Khandi creek and Udaipur-Talsari beaches of Balasore district along with Gahirmatha and Bhitarkanika. Nesting has also been documented from Eakakula beach in Balasore district and Hukitola and Jambu in Kendrapara district and Puri beaches in Puri district of Odisha.

The recommended conservation actions and guidelines for Horse-shoe crab in Odisha are as under;

i. The occurrence sites and breeding grounds of the Horse-shoe crabs along the Chandipur coast be safeguarded and protected from destructive fishing which directly impact the Horse-shoe crab and from beach tourist walking on to the inter-tidal beach which indirectly destroys the breeding ground.

ii. Education and awareness signage of Do's and Don'ts on safeguarding the Horse-shoe crab for beach tourists be placed at vantage locations at Chandipur, Balramgadi and other key locations.

iii. An alternate fishing practice on the receding tidal waves be developed in consultation with CMFRI and CIFT so that the current destructive methods of pole net fishing practiced by local fishermen which is detrimental to Horse-shoe crab is dispensed with.

iv. Providing alternate fishing methods to the current destructive methods detrimental to horse-shoe crabs.

1.2.7.7 Managing wildlife outside protected areas (Blackbuck)

The Indian Blackbuck (Antilope cervicapra), is one of the three species of antelopes found in Odisha. The other two are Nilgai (Boselaphus tragocamelus) and Chowsingha (Tetracercus quadricornis). Blackbuck is considered to be one of the fastest animals in the world. There has been a dissolute decline in the population of blackbucks throughout the country due to poaching and habitat loss. In the recent past, this endemic animal was most numerous, commonly seen large wild mammal in the Indian subcontinent. Subsequently, within a short span of time, it has suffered much reduction in numbers. Blackbuck is included in the Schedule-I of Wildlife (Protection) Act, 1972 and is designated as Vulnerable as per Red Data Book (1994).

In Odisha, the species was widely distributed in Balasore, Puri and Ganjam districts, now it is confined to Balukhand-Konark coastal plain/wildlife sanctuary in Puri district; Balipadar-Bhetnoi and adjacent areas in Ganjam District. In Odisha, the estimated population of blackbuck is about 800 to 900 and considered to be increasing.

The Balipadar-Bhetnoi area comprises of about 70 villages of Buguda, Aska and Kodala forest ranges of Ganjam District. The Blackbucks of these areas are protected religiously by local communities. The belief that the presence of blackbuck in paddy fields brings prosperity to the villagers has greatly contributed to the conservation of this species. The villagers do not kill the animal even if it strays into the fields and grazes their crop.

A research scheme was partially implemented with the financial assistance from the Ministry of Environment and Forests, Government of India, for collection of basic scientific information on the isolated population of blackbucks in Balipadar- Bhetnoi area during l995-96. The studies documented; (i) population status, sex composition, herd structure and social grouping (ii) distribution pattern of the animal and threat aspects, and (iii) breeding biology (natality /mortality parameters) etc.

Steps were taken to reintroduce blackbucks into Bhitarkanika Wildlife Sanctuary during 1985-87 by rehabilitating 14 (9M+5F) zoo bred individuals of Nanadanakanan Zoological Park stock. However, they could not adjust to the new surrounding and perished within a couple of months.

Realizing the significance of the blackbuck, the Ballipadar area is being developed as a "Community Reserve" in accordance to the provisions of Wildlife (Protection) Act as amended in 2002. It primarily covers three Forest Ranges i.e. Buguda and Aska under Ghumsur south Division and Khallikote Range of Berhampur Forest Division. The state highway from Khurda to Berhampur, via Nayagarh, also passes through their habitat. The blackbuck habitat includes about 60% cultivated lands/cropped fields, 15% rocky elevations, 10% man-made houses and roads, 8% forest cover, 5% water bodies and 2% horticulture farms and waste lands.

The OSCOW-MAG recommends to initiate a blackbuck conservation project considering the below mentioned points:

- An assessment of population status and dispersal pattern of blackbucks
- Initiating an innovative community-based blackbuck tourism plan

- Setting in place an innovative crop protection plan (insurance cover)

1.2.7.8 A management plan for sloth bear in Odisha

Sloth bear (*Melursus ursinus*) is the only bear species found in Odisha. Previously, distribution of sloth bear covered almost the entire state, but in the last two decades, its distribution range decreased to half due to massive habitat destruction by mining and deforestation.

Distribution and relative abundance

Of 30 districts in the state of Odisha, sloth bear is distributed in 12 districts - Angul, Sambalpur, Khordha, Koraput, Malkanigiri, Rayagada, Dhenkanal, Nayagad, Boudh, Ganjam, Nabarangpur and Puri. Out of 50 forest divisions in the state, bear presence has been recorded in 44 forest divisions. The bear occurs in 14 out of 19 protected areas of the state, namely Simlipal Tiger Reserve, Satkosia Tiger Reserve, Chandaka Wildlife Sanctuary, Sunabeda Wildlife Sanctuary, Baisipalli Wildlife Sanctuary, Karlapat Wildlife Sanctuary, Kuldiha Wildlife Sanctuary, Hadagarh Wildlife Sanctuary, Kapilash Wildlife Sanctuary, Bamra Wildlife Sanctuary, Debrigarh Wildlife Sanctuary, Khalasuni Wildlife Sanctuary, Kotagarh Wildlife Sanctuary and Lakheri Valley Wildlife Sanctuary. Captive sloth bears are in Nandankanan Biological Park. The contiguous habitat between Odisha and Chhattisgarh allows movement of the species across the political boundaries.

Following conservation actions are proposed for the species:

a. **State wide survey for creating baseline**

A state-wide survey on the status and population of sloth bear, together with sampling of vegetation to understand quality of habitats is urgently required. The exercise would help identify potentially significant areas for conservation of sloth bear, areas that are highly suitable but threatened due to developmental activities and areas that have good habitat which otherwise can be recovered with suitable population recovery program and other management interventions. Key bear habitats should be identified along with the conflict hotspots and mapped. Local Universities/ NGOs/ Institutions/ communities should be collaborated in the endeavor.

b. **Habitat management**

Potential bear habitats in the state should be identified, assessed and mapped. Key habitats may be prioritized and eco-development activities should be strengthened in fringe areas of such habitats. Site-specific habitat restoration plan should be formulated and executed. It is experienced that NTFP collection and unsustainable dependency of local on the forest leads to habitat degradation and loss. However, the fact is that the issue of forest conservation and provision of livelihood should be addressed collectively. When locals become the primary party, only then forest can be effectively protected and this can be achieved when the need of locals are fully understood and met through appropriate measures.

c. **Human-bear Conflict**

The dynamics of conflict should be assessed in conflict hotspots in the entire state. The rapid response teams may be constituted including the local communities at the divisional level,

especially in high conflict zones. Awareness activities should be undertaken to reduce cases of chanced encounter of people to bears. A corpus fund can be created in each division to address emergencies arising due to conflict situations. Bear mauling should be properly assessed and victims of temporary or permanent disability due to bear attacks should be provided adequate ex gratia support. Adequate infrastructure should be created for addressing conflict scenarios.

d. Protection of bear

Baseline information should be generated on bear trade and the communities involved in the poaching activities and their modus operandi. An intelligence network should be developed to deter instances of bear poaching and trade. Better coordination between stakeholders mainly the forest department officials and law enforcement agencies can help check animal poaching and control mob during man-animal conflict situation.

Training of field staff and officials on legal and enforcement aspects in bear ranging divisions should be made mandatory to strengthen protection mechanism for crime control. Legal cell should be created and prosecution mechanism should be strengthened. A panel of green lawyers could be created in the state by engaging eminent legal practitioners. Stray and problematic bears should be reported and properly monitored. Information should be shared with appropriate enforcement authorities, especially with neighbouring states on inter-state illegal trade network. There is an urgent need to form rescue teams, comprising of wildlife veterinarians, managers and ground-staff who would rescue animals from conflict sites, taking consideration of the animal's well-being and undertake rapid actions in conflict cases in the state.

e. Training and capacity enhancement

To check the rising trend of sloth bear-human conflict and its poaching, frontline officials and staffs are required to be effectively trained. Forest officials posted in identified high conflict areas or areas prone to poaching should first receive adequate training. Often, it is found that staffs are caught unaware in a conflict situation and most of the time the angry mob blames the forest department for the injuries they have suffered or the loss of lives that occur due to conflict. Capacity of the forest department staff should be enhanced to put an end to illegal trade of live bear cubs and body parts. Young and dynamic staff may be employed in naxal prone areas. Periodic evaluation of capacity building programs should be done. Rewards/ incentives may be provided to frontline staff and local communities for outstanding performance in bear conservation. Dedicated rescue vehicles design for the purpose of conflict mitigation should be provided to the state. Forest officials are often given the task of monitoring the large administrative areas with limited travel and logistic support. In order to effectively patrol the area, adequate manpower and good infrastructure are the prime requisites.

f. Awareness and education

Where there is a man-animal conflict, the attitude of the locals towards the animal is often negative due to the damage either in the form of injury or death and/or loss of crops they face. They put blame entirely on the forest administration and believe that the department is the only owner of sloth bear and they should check the animal from entering into human dominated space. In such a scenario, education drive has been regarded as an effective tool in shaping the local's attitude and in integrating local people in various conservation programs. Informing

them about Do's and Don'ts becomes an effective means to self-protection from potential animal attack. Hence, village level institutions should be trained to spread and promote sloth bear conservation message. Corporate sector/ NGOs/ NGIs could be involved in funding and undertaking certain components of the sloth bear conservation plan. A mechanism for local community participation in bear conservation in aspects of planning, decision making and execution should be developed. Effective and responsible media coverage on threats and conservation initiatives for bear will help sensitize people.

g. **Bear welfare**

A holding facility/centre with state-of-the-art facilities for bears should be developed. Bear rescue data may be maintained using well designed protocol and used for designing conservation plan for the species. The possibilities of rehabilitating rescued bears should be explored.

1.7.2.9 Initiate a Pangolin project

Odisha has been a hotspot for trade in pangolin scales. Till the late 1980 heaps of pangolin scales have been observed on sale in front of Cuttack and Bhubaneswar railway station. However, due to raids by enforcement agencies such open trade of pangolin scale is no longer a sight. During the process of circle level and division level consultation reports of pangolin rescue cases in several divisions of Koraput, Bhawanipatna, Behrampur and Bhubaneswar circle were shared by the participants. Participants from several divisions of other circles also opined that pangolin do occur in their area as well. Currently the Nandankanan Biological Park operates a pangolin breeding program which is largely based on creating a founder stock for conservation breeding programme from amongst the rescued pangolins.

Following recommendations are being made for Pangolin conservations:

1. Pangolin project of Nandankanan be expanded to integrate the in-situ component as well so as to identify the pangolin occurrence hotspot in the wild and to assess their population status.

2. Based on the confiscation of pangolin scale in illegal trade and their volumes, initiate a pangolin scale trade component in the integrated pangolin research project.

3. Since the CITES has identified the pangolin to be one of the most important illegally traded wild animal, it is suggested that the Odisha forest and wildlife department produce suitable education and awareness materials such as posters and brochures, social media film clips, radio and television talks on pangolin conservation so as to enlighten the general public of Odisha, to inform the State Forest Department about sighting, poaching and trade of pangolins in any part of the state.

4. An international pangolin conservation seminar should be organized at Bhubaneswar to place the species as one of the key species in Odisha's wildlife arena.

1.7.2.10 Feasibility assessment of wild buffalo restoration

The Asiatic wild buffalo or the Indian water buffalo (Bubalus arnee), considered to be the wild progenitor of the domestic water buffalo (Bubalus bubalis) is a globally 'Endangered' bovid (IUCN 2016). An important part of many wild wetlands of India and South East Asia, the wild buffalo is among the largest

land mammals in the country, after the Asian elephant; and the great one-horned rhinoceros; and is similar in height and weight to other wild cattle, the gaur. Indian law has accorded it the highest level of protection by including it under the Schedule I of the Wildlife (Protection) Act, 1972. The species is also listed in the Appendix III of the Convention of International Trade for Endangered Species of Wild Flora and Fauna (CITES). In July 2001, it was also declared as the State Animal of Chhattisgarh.

In India, the wild buffaloes were numerous and widely distributed in the riverine forests and plains of the northeast, extending west from the plains of the Ganga and Brahmaputra to Uttar Pradesh, and southwards through eastern peninsular India to the Godavari river. Presently, the last bastion of the wild population lies in Northeast and Central India. Assam's Manas, Kaziranga, Pabha, Laokhowa, Sankosh-Manas riverine tract and Lakhimpur support the largest populations, with about an estimated 3,000 individuals. The Central Indian populations have been declining alarmingly; populations in most states have gone extinct, and by the end of 1980's, they were restricted to five Protected Areas (PA) in the state of Madhya Pradesh (currently, they fall within the state of Chhattisgarh, carved out of the former in 2000).

Populations further declined, and in a comprehensive survey by the Wildlife Trust of India (WTI) and the Chhattisgarh Forest Department (CFD) in 2005 found that the species had only about 40 individuals left in three PAs of the state - Indravati Tiger Reserve, Udanti Wildlife Sanctuary and Pamed Wildlife Sanctuary. Hence, the OSCOW-MAG recommends the state forest department to initiate a wild buffalo restoration project after considering the below mentioned points:

- Record historical occurrence reported in wilderness regions in Odisha
- Conduct a habitat suitability analysis
- Identify possible source population for reintroduction
- Prepare relocation sites
- Effect translocations, and
- Monitor the reintroduced population

1.7.2.11 Preparing and implementing an action plan for conservation of Indian Skimmer

The Indian Skimmer (Rynchops albicollis) is a riverine bird and listed as Vulnerable in the IUCN Red List. It has been reported from River Mahanadi and wetland and mangrove habitats such as Bhitarkanika, Nalabana in Chilika, Satkosia, Mundali in Cuttack, Dhamra, Hirakud and sandy islands of the River Mahanadi. Undisturbed sandbanks spits and islands of large rivers are necessary for breeding of the species. Rise in water level, cattle grazing and disturbances due to fishing activities are major hindrances in breeding success, while use of pesticides in prawn fishing and industrial effluents pollute the riverine habitats adversely affecting its population.

Following recommendations are being made for conservation of Indian Skimmer in Odisha:

1. The specific sites with confirmed presence / breeding of Indian Skimmer, especially outside protected areas need to be protected. An action plan to enhance protection and management of Indian Skimmer sites needs to be developed, specifically for Athgarh and Satkosia divisions.

2. The river stretches and wetlands used by the species should be identified and

managed. The wetlands used as feeding areas needs to be actively managed and pertinent threats should be mitigated.

3. There is a dearth of researches on the Indian Skimmer, especially on breeding colonies in Odisha. Hence, specific research on the theme is highly needed and should be a part of the action plan.

1.7.3 Rationalizing a network of protected areas in Odisha

The broad scheme focused on rationalizing a network of protected areas in Odisha for effective management of wild animals. Under this plant the vision for the future with respect to the protected area network of the state of Odisha is to have:

i. Ten percent of the geographic area of the state to be brought under the protected area network comprising of Wildlife Sanctuaries, National Parks, Conservation Reserves and Community Reserves (in place of 4.2% at present).

ii. Representatives of critical habitats, species and genetic biodiversity secured within the PA network.

iii. Each forest/wildlife division in the state has at least one protected area.

iv. One-fourth of the forests of the state which qualifies as prime elephant habitat within the eastern India elephant range is managed as elephant reserves and 10% of the forest area which is prime tiger habitat is managed as tiger reserve. Grossly, 3/4th of the tiger and 90% of the elephant should be within tiger and elephant reserves of the state.

v. The state of Odisha lies on three biogeographic zones – Deccan Peninsula, Gangetic Plain and Coasts. The existing 19 protected area of the state (with 4.2% geographic area) are spread across three bio-geographic provinces (Eastern Plateau – 8 PAs, Chhotanagpur – 7 PAs, and Eastern Coast – 4 PAs) of two biogeographic zones – the Deccan Peninsula and the Coasts. However, the spread of PAs in the state is uneven. There is no PA in Koraput Circle and many forest divisions. Keeping in view the biodiversity richness, the state should stride to have at least one PA in each forest division.

To implement this abovementioned vision, the OSCOW-MAG recommended the state government to initiate a biogeographic zone based program to enhance the present 4.2% PA network to at least 7-8% (better to be up to 10%) of the geographic area. The suggested recommendations are as under.

i. Expand the Satkosia Tiger Reserve by including the adjoining forests in the Mahanadi northern bank forest landscape as an enlarged Tiger Reserve.

ii. Examine the feasibility of setting in place a second TR/ elephant reserve in the south bank of Mahanadi river encompassing the forests landscape of Boudh and Phulbani

iii. Gazette the Sunabeda TR at the earliest and prepare a landscape level trans-boundary tiger conservation and management plan in consultation with the neighbouring state of Chhattisgarh.

iv. Revisit the protected area network of the state and examine the feasibility of considering the suggested gap areas by Rodgers and Panwar into the PA network.

v. A number of reserve forests in the state have been proposed by various divisions and circles as possible PAs which requires a feasibility assessment at the earliest and where possible they be

declared as PAs at the earliest. If the feasibility does not find them to be a Sanctuary, the prospect of them being considered as Conservation Reserves be explored.

vi. The BNHS and Birdlife International have identified several locations in the state as Important Bird Areas (IBA) and possible RAMSAR sites. These should be legally protected.

vii. Similarly, WII has recommended some sites along the Odisha coastal Zone as Important Coastal and Marine Biodiversity Areas (ICMBA). The possibilities of these areas as future PAs - Conservation Reserve, Community Reserve and Biodiversity Heritage Sites be considered.

viii. The reserve forest surrounding the Ghodahada reservoir should be included in the adjoining the Lakhari Valley Wildlife Sanctuary as the area harbours a good elephant population.

ix. A biosphere reserve in the Eastern Ghats of Odisha including the Mahendragiri and Karendimala hill range be examined to supplement the Simlipal Biosphere Reserve.

x. The following locations be examined for their prospect as Conservation Reserve / Community Reserve

a. Blackbuck supporting areas of Ganjam District

b. Rushikulya Sea turtle rookery

c. Chinchiri River mouth turtle mass nesting area

d. Horse-shoe crab habitats of Chandipur and Balramgarhi in Balasore district

xi. Expand the number of 17 wetland sites in the state wetland regulatory authority by including several wetlands that are in the forested/non-forested surroundings in different forest circles particularly in Koraput district.

xii. Explore the possibility of creating a network of PAs in the corporate sectors operational area on a PPP model as co-managed wildlife areas. Some of the system sectors are;

a. Port sector (Horse-shoe crab and marine turtles)

b. Hydrocarbon sector (ICMBA's)

c. Irrigation and Hydro power sector (manmade wetland bodies as bird reserves)

xiii. The Protected Area Management Effectiveness Evaluation (MEE) initiated by MoEF&CC has already evaluated the two tiger reserves and several of PAs of the state and has suggested a range of actions to be taken. It is recommended that the CWLW of Odisha, sets up a sub-committee under his chairmanship to review the suggested action and implement them before the PAs are ready for the next round of MEE.

1.7.4 Eco-restoration of degraded, disturbed forested landscape and or wildlife habitat outside the PA network

Under the broad scheme Eco-restoration of degraded, disturbed forested landscape and or wildlife habitat outside the PA network were prioritized and key action points were recommended.

A quick review of the forested and non-forested landscapes of the state reveals that other than the well managed PAs, the habitat in several circles have been disturbed or degraded due to anthropogenic or

developmental requirements. Natural events like fire, cyclones, flood and anthropogenic developments like mining, linear development, industrialization, urbanization and such other actions have contributed to the ecological degradation.

Forest circles like Koraput and Bhawanipatna (degraded due to fire, slash and burn agriculture and mining), Rourkela, Baripada and Angul (mining and linear development), Berhampur and Bhubaneswar (Urban growth and coastal development), Sambalpur (linear development and industry) have all been victims of such damage.

Environmental Impact Assessment (EIA) has suggested the project proponents to re forest alternate landscapes. The Environmental Management Plan (EMP) for mining impacted habitats have been prepared and the Divisional Forest Officers are entrusted with the responsibility of implementing those eco-restoration measures in the buffer areas of main developmental zones of mining sector for which the concerned industries have to bear the cost, which are deposited in the state CAMPA funds. These plans are prepared by consultants and reviewed at various levels of the forest administration of the state before clearance of the EMP, afterwards the plans are operationalized by the industry.

The mineral rich state of Odisha, however has been in the limelight after impacting forested and wildlife habitats very significantly due to mining. Similarly, the irrigation and hydro-power sector have caused inundation due to submergence of forest lands. Similarly, linear infrastructure development such as transmission lines and canals have also taken a toll on the forested landscapes. The linear development and establishments of ports, harbours and industries along the coast have impacted the coastal and marine habitats including the mangrove covers.

Located as it is along the Bay of Bengal, the state is subjected to stochastic events such as flood, draught and cyclone; though the forested coastal zones have the intrinsic resilience for such events in long run, once devastated, the areas are not allowed for natural recovery as the ravaged landscape are used for other alternative development. Aquaculture has also taken its toll on the mangroves and coastal lagoon environment and has made large tracts of coastal landmass unsuitable for any long-term recovery.

In this scenario, the OSCOW-MAG project suggested the state to begin a new project entitled "SRUJANA" that will take care of such impacted landscape, waterscape and coastal scape under its eco-restoration program.

Restoration ecology being a new subject beyond afforestation, the eco-restoration effort will have to be dependent on more scientific, professional guidance and approach. Even though the impacted habitats will not be brought back to their former ecological status, a professionally and timely approach of eco-restoration by first embarking on habitat restoration followed by species restoration will enhance the biodiversity supporting values of such areas significantly. Such practices will also enhance the reproductive and renewable resource generation ability of such areas, thereby contributing for supporting the local livelihoods besides supporting biodiversity values.

The suggested specific actions for eco-restoration of abovementioned landscapes ranges from generic administrative, to infrastructure, to location specific actions with an aimed result of "regenerating" the ecological settings and values of the locations. The suggested actions are as under.

i. The Eco restoration project is a state-wide habitat specific program. It is recommended that a special Cell with a senior PCCF as its Head to be created. The research and developmental circle be

its advisory arm and the implementing arm would be the forest divisions under the supervision of territorial and other circle heads. The first and foremost responsibility of this cell will be to prepare a database of all impacted habitats including the recommended actions given during the clearance. The cell would also create a database of all EMP created and the funds allocated for implementing them. Based on this database, the cell would monitor, direct and supervise the field level implementation within the timeline given to the project implementers. It will also monitor the results of such restoration activities in a scientific manner through the R&D circle and where necessary through outsourced agencies monitoring and reviewing the on-site implementation. An annual report will be produced by the Cell on the lines of the FSI report on the status of the impacted habitats and the results of the eco-restoration actions and place it at the state assembly through the state government hierarchy.

ii. The Odisha coast has the second largest extent of mangrove cover along the east coast after the Sundarban in West Bengal. However, the intense pressure of coastal human and livestock populations have taken their toll on the mangrove bearing areas. The development of aquaculture and other coast based developmental projects have also contributed to loss and degradation of the mangroves in the state. In this backdrop, in addition to bringing all mangrove supporting areas under the reserved forest category, it is recommended that, wherever possible the suitable tidally influenced habitat areas be brought under mangrove eco-restoration program. Some specific areas where this could be taken up are the Devi River estuarine region, Balukhand Area, Rushikulya estuarine region along the Chilika-Palur canal and areas outside the Bhitarkanika Wildlife Sanctuary and Kujang region.

iii. The shoreline Casurina plantations along the coastline of Odisha as "Cyclone shelter Belt" has invaded the sea turtle nesting beaches and have destroyed the natural sand dunes and their vegetation in many regions such as the Satabhaya region, Chinchiri river mouth, Chilika Coast etc. In these areas, the turtle nesting beaches be restored by removal of the Casurina and planting of suitable local sand dune vegetation on to the landward side from the "berm" rather than on the intertidal areas.

iv. The receding intertidal regions of the Chandipur coast on either side of the Budhabalanga Estuary are the major breeding ground of the horse-shoe Crabs. The ill planned tourism development infrastructure growth and local destructive fisheries methods be stopped and a local area development plan be initiated. The main focus of this local area development plan would be restoration of the naturalness of the region so as to make the area suitable for the horse-shoe crab and the wide receding scenic beauty of the tide that brings the tourists to this place.

v. Restoration of important wildlife habitats outside the Protected Area network of the state such as;

   a. Grassland development and restoration in the blackbuck distribution range in Ganjam

   b. Cyclone and storm damaged coastal and marine habitats

   c. Fire ravaged wildlife areas in different forest circles (Koraput in particular)

   d. Mining damaged/degraded wilderness areas in the different forest divisions including wildlife corridors be restored on a priority.

vi. The freshwater Anshupa lake and the Tampara Lake support significant biodiversity values. Management and restoration of these wetlands should be done as per the management plan endorsed by the State Wetland Management Authority.

vii. The coast-based heronries that have been damaged during the recurring cyclones and storms be revisited and restored after development of proper restoration plan for each of these heronries.

1.7.5 Ex-situ in-situ integration program

Under the broad scheme, Ex-situ and in-situ integration program were studied and action points were suggested. With the creation of Nandankanan Biological Park on the outskirts of Bhubaneswar during the late 50's Odisha established itself as a state with a greater focus of managing wild animals in captivity. Today Nandankanan biological park stand amongst one of the most well managed ex situ conservation facility in the country.

It was also during the mid-70's the state embarked on creating exclusive ex-situ conservation facility with linkages of re-introduction in in-situ. With the setting up of Tikarpada gharial rearing centre along the Mahanadi Basin, Dangmal salt water crocodile rearing centre in Bhitarkanika and the Ramtirtha mugger rearing centre in Simlipal with a fourth dedicated conservation breeding and rearing centre for the three species of crocodilians at the Nandankanan biological park has paid the dividends. The Gharial was successfully bred for the first time in any ex-situ facility in the world during the early 80's. This ex-situ and in-situ linkage crocodile conservation project has also facilitated the creation of the Bhitarkanika Wildlife Sanctuary where the saltwater crocodile has reestablished itself post reintroduction program. The Satkosia Gorge Sanctuary was also created for reintroduction of Gharial into Mahanadi, the southernmost and independent population of Gharial in peninsular India. The crocodile conservation project of Odisha has not only established the crocodilians in the state but has firmly established the ex-situ and in-situ linkage programs as a model for future developmental programs.

The Nandankanan biological park became the fountain head for providing herbivore into the several "deer parks" in the state as the second levels of ex-situ and in-situ linkages. The small-scale hatchery programs of the olive ridley turtle is yet another ex-situ and in-situ linkage complementing conservation activity for the marine turtles.

Creation of the pangolin and the vulture conservation breeding programs in Nandankanan Biological Park are the programs of future that will enhance the integrated ex-situ and in-situ conservation program of the state. As far as flora is concerned, establishment of the regional plant resource centre in Bhubaneswar has been a landmark development which has led to a successful ex-situ propagation of several species of orchids and cactus and has created a "gene bank" for several endangered and threatened plant species of Odisha. The Regional Plant Resource Centre (RPRC) in Bhubaneswar has the knowhow and technical human resource to establish in-situ plant conservation facilities elsewhere in Odisha, targeting not only rare, endangered and threatened species but also medicinal plants and other commercially important plant species.

With this background after completing review of the ex-situ and in-situ conservation programs, the OSCOW-MAG recommends the state government to initiate a new umbrella program for integrated ex-situ and in-situ conservation scheme. The recommendations in these are;

i. Revive the Gharial ex-situ Conservation and Rehabilitation Project to reorient and develop

appropriate in-situ and ex-situ linked project that will help re-establish the critically endangered Gharial in the Mahanadi River Basin.

ii. In addition to Nandankanan Biological Park, there are 14 other ex-situ facilities spread across the state. A review be made of their current function and role in complementing the conservation of wildlife and education and awareness creation and a more realistic continuation/closure or improvement plan within the framework and policy Guideline of the Central Zoo Authority be developed.

iii. It is recommended that the following new and/or upgraded ex-situ Conservation facilities be developed for which suggestion and advice from national and international professional organization be sought for. The suggested facilities are:

   a. A Mangrove Resource Centre at Bhitarkanika, a site with highest diversity of mangrove plants in India.

   b. A state of art Orchidarium and a Hill Myna Conservation Breeding Project in Similipal Biosphere Reserve.

   c. A network of Medicinal Plant Resource Centres in the state in Boudh - Kandhamal, Gandhamardan Hills and some other locations under the supervision and guidance of the Regional Plant Resource Centre.

iv. Create a State-of-the-art off-exhibit "Conservation Breeding Facility" in the Nandankanan Biological Park to expand the existing Conservation projects such as the vulture, pangolin and to include new species such as mouse deer, ratel, otter, fishing cat, water monitor lizard and some other species depending on their prospect of re-introduction in the wild.

v. With the visitor number to the Nandankanan Biological Park increasing every year and expected to touch 50 lakhs per annum in a few years, the zoo infrastructure and facility is required to be upgraded with a new master plan and layout plan including visitor flow and parking facilities. Nature trails and other concepts to diffuse visitors to different locations may also be considered.

vi. Build on and upscale the successful pangolin ex-situ conservation project of the Nandankanan Biological Park linking the project with in-situ reintroduction and monitoring programme. It is suggested to organise an International Conference on Pangolin (In the recently concluded CITES COP Pangolin was the focus species) at Bhubaneswar to learn about the best practices from other practitioners them to make the Pangolin Project in Odisha a National Project.

vii. A separate program for reintroduction Batagur baska and Pelochelys cantorii turtles which has locally become extinct in Bhitarkanika and other littoral wetland of Odisha.

viii. An artificial incubation and grow and release concept based community involved hatchery program for soft-shell and hard-shell freshwater turtles in Naraj, Satkosia Gorge and Hirakud reservoir be initiated.

ix. Based on the consultation meetings held at forest circle HQ it is recommended that a network of wild animal rescue centres may be planned one each for each forest circle. The recommended locations are Nandankanan, Koraput, Sunabeda, Sambalpur, Ramtirtha, Banjnagar, Tikarpada and Raurkela.

1.7.5.1 Setting up of wild animal rescue and rehabilitation programs

i. Network of emergency relief units: Have a network of strategically placed rapid response units (RRU) that can function as a rescue and disease surveillance units for both terrestrial and aquatic realms.

ii. Since wildlife rescues are reported from almost all divisions, especially from non-wildlife areas, a regular program for equipping and capacity building of select frontline forest staff of various divisions and sensitization of other stakeholders is needed.

iii. Orphan animal care: Orphan mammal rehabilitation should be taken up by engaging dedicated staff who are professionally trained.

iv. Stakeholders participation in conflict animal management: Participatory approach will help local people develop ownership and would in turn help in ameliorating the animosity they have with the Forest Department during conflict situations

v. Inventory of rescue data: A good comprehensive database of wildlife displacements should include the nature of intervention, accurate identification of the species, the habitat at the site of intervention and the final solution of the cases attended.

1.7.6 Capacity Enhancement

The broad scheme focused on capacity enhancement of forest staffs and associated workforce those are engaged for protection of wildlife. With 4.2% of Odisha land area under Protected Area network and with 19 protected areas conserving the state's diverse habitats, flora and fauna, geological formations and ecological processes, the state requires not only complementary and skilled human resources but also adequate infrastructures. Led by the Principal Chief Conservator of Forests and CWLW and Addl. PCCF (WL), CCF Wildlife and Wildlife Wardens in charge of specific wildlife divisions, the wildlife conservation agenda is also addressed by the territorial forest division under the guidance of Regional CCFs. The two tiger reserves, 2 RAMSAR sites and the network of protected areas are managed by a team of dedicated forest officials. Several of the protected areas are managed by professionally trained officers and middle level managerial staff. However, there has been a shortage of wildlife management trained frontline staff and also especially skilled complimentary personnel such as wildlife veterinarians, biologists and research officers.

With protected area management effectiveness evaluation and reporting of ecological status of the RAMSAR sites, biosphere reserves and tiger reserves the need of skilled biologist, research officers, sociologist, GIS experts for creating and monitoring of the benchmark ecological status of PAs cannot be overemphasized.

With human-wildlife conflicts, wildlife diseases, wildlife presence in human dominated landscape is on rise; capture, translocation, treatment and several other specialized operations requiring dedicated wildlife trained veterinarians has been a long felt need in the state.

The absence of a dedicated institution to cater to the training needs of the frontline skilled manpower for wildlife conservation has also been clearly noticed. The increasing foot falls of visitors into the protected areas of the state require professionally trained interpreters, guides and visitor facilities including interpretation centres in PAs is also a long-felt requirement in the state for implementing responsible ecotourism programs in the PAs.

With this background, the Odisha State Comprehensive Wildlife Management Guidelines project

recommends the state government to initiate a capacity enhancement scheme entitled "SAKHYAMA" to address and create the environment for new infrastructure and skilled human resources. The suggested recommendations are the following.

1.7.6.1 Create a cadre of Wildlife Biologist/Research Officers in the state

Odisha was the only state with three regular research officers in place when the crocodile and sea turtle conservation program was in operation. The three wildlife research officers continued in the department till superannuation. Since then, there has been no wildlife research officers in position. With the requirement of more scientific and professional outputs for wildlife related problems, the need for such scientific staff is a must. It is recommended that the wildlife wing of the state should create a cadre of wildlife biologist/ research officers, if possible, for all protected areas. This can be done either by clustering a few small protected areas as one for which one research officer can be appointed. Research Officer must have a dedicated and complementing transport and other infrastructure including laboratories.

It is suggested that state to have four regional wildlife biologist/research officers (one each for two forest circles). These regional wildlife biologist/research officers are recommended to be at Berhampur (Bhubaneswar and Berhampur circle), Baripada (Baripada and Rourkela circle), Sambalpur (Angul and Sambalpur circle) and Koraput (Koraput and Bhawanipatna circle) and also create a position of State Wildlife Research Officer attached to the CWLW. In the long-term attempt should be made to have an independent wildlife research officers one each for all PAs.

1.7.6.2 Setting up a cadre of wildlife veterinarians in all PAs/Rescue centres

It is recommended to create a cadre of trained wildlife veterinarians for managing the in-situ and ex-situ wildlife health related problems in the state. To begin with, the wildlife veterinary unit based at Nandankanan Biological Park should be upgraded to the state Chief Wildlife Veterinarian. To be complemented by four regional Wildlife Veterinarians at Berhampur (Bhubaneswar and Berhampur circle), Baripada (Baripada and Rourkela circle), Sambalpur (Angul and Sambalpur circle) and Koraput (Koraput and Bhawanipatna circle). The additional vets on contract can be appointed for any other extra infrastructure that can be created or required. For example, the mobile veterinary unit at Simlipal and a chain of wildlife rescue centre that are proposed to be created should have a veterinarian in charge. The chief veterinarians and the regional veterinarians should have adequate infrastructure including tranquilizer equipment's and mobile veterinary unit. The other complementing suggestions for wildlife health management plans for the state of Odisha are as under.

i. **Disease surveillance and monitoring**

   a. Strengthen the existing Centre for Wildlife Health (CWH) at the College of Veterinary Sciences and Animal Husbandry, Bhubaneswar by initiating a coordinated wildlife disease surveillance program in collaboration with other faculties of the college.

   b. Incorporate aquatic animal health also into the curriculum of veterinary students graduating from the college.

   c. Establish two ocean health surveillance stations in the field, just like the regional animal disease diagnostic laboratories being planned by the Odisha government.

   d. A national workshop on disease investigation procedures of elephant deaths should be organized.

   e. Appoint a dedicated fulltime officer-in-charge for the CWH at the College of Veterinary Sciences

and Animal Husbandry and also expand its horizon of activities to active research-oriented disease surveillance that would also help the state predict the emergence of new diseases, both among terrestrial and marine wildlife.

f. Commission database on wildlife diseases (reports, epizootics, surveillance and prevalence) based on reports coming from the field.

ii. **Preventive and control measures**

a. Develop and maintain an immune belt of 2 km width around all inland Protected Areas.

b. The government of Odisha as a policy should ban, in phases, the use of plastic bags.

c. The forest department should pursue the state's Pollution Control Board to ban on dumping of industrial and human wastes into the sea.

1.7.6.3 Establishment of a State Wildlife Training centre for frontline staff

The PA managers of the state are currently trained at the WII. However, due to paucity of staff, even this opportunity of skill up-gradation of wildlife managers at different level has not been availed properly. Some of the officers who have been trained in the wildlife management are currently working in territorial and other forest divisions. So also, is the case with respect to the range officers. A review at the WII reveals that Odisha has not fully availed the training opportunities provided by the WII. The situation for the staff below the range officer level such as forester and forest guard are even more difficult as there is no customized wildlife management training being provided to these frontline staff within the state. Since the grassroots level frontline staffs are to be technically skilled and that too in the local language, it is suggested that the forest training institution at Angul be upgraded to serve the purpose of a state level wildlife training center. The trainers at the center can be the officers who have already been trained at WII. A suitable curriculum targeted for the foresters and the forest guards can be developed after examining the existing syllabus followed by Tala Wildlife Training Center at Bandhavgarh Tiger Reserve, Madhya Pradesh. The assistance of WII can also be taken, for developing syllabus and training resource material.

1.7.6.4 MoUs with National/State institutions and organizations for capacity building program

The state may facilitate the capacity building program of its PA management staff by development of MoU/MoA with National/State institutions. The customized senior level, mid-level and frontline wildlife staff training program can be developed and implemented in consultation with institution such as WII, CZA, SACON, WTI, WWF-India, BNHS and WCT. Similar MoU/MoA can also be developed for veterinary and forensics syllabus and implementation of training program with IVRI, CCMB, OUAT, WII, WTI and CZA.

1.7.6.5 Setting up of a trained and accredited community-based wildlife rescue and enforcement network

Since the wildlife rescue and rehabilitation work in the state is now largely confined to be dependent with the Nandankanan biological park unit and some local vets elsewhere. It is recommended that the wildlife wing of the state may need to identify community-based NGOs of the state to build their capacity for wildlife rescue and rehab and give them accreditation so that each of those unit can serve as a complementing agency to the local forest and wildlife staff for quick wildlife rescue and rehabilitation.

A good example of this is WTI's Emergency Relief Network (ERN) which has membership of NGOs and individuals all over the country. The members are provided skill up gradation training at regular intervals of how to deals with emergency rescue of wildlife in disaster situations as well as human-wildlife conflict situation. The example is the accreditation of several NGOs by the Gujarat FD and Karnataka FD who provide emergency rescue and rehab facility for distress wildlife at a very short notice.

1.7.6.6 Capacity building of wildlife and nature guides around protected areas for better implementation of responsible eco-tourism

With increased footfall of tourist into the protected areas of the state, the requirement of the tourist guides for proper decimation of interpreted wildlife message is increasingly been felt. The case in point is Chilika dolphin watch program where the visitor number far exceeds the provisioning of proper guides. Similar problems are also faced in Bhitarkanika, Similipal, Nalaban and few other PAs. It is recommended that an organized program for identification of local youths around PAs who can serve as nature guide can be set in place. A good example of this is the identification and skill development of local youths as wildlife and nature guides in Corbett Tiger reserve, Khana TR, Keolodeo Ghana NP and Ranthambhore TR.

Local youths and tribal with good knowledge about wildlife have been selected and their skill is enhanced in communicating interpreted wildlife awareness messages have paid rich dividends in creating local support for the PA and at the same time providing a rich and responsible ecotourism experience to the visitors. A model of any of these abovementioned case studies can be replicated in and around the PAs of Odisha. The other two examples are outside the PAs in Odisha i.e. Mangaljodi bird watching and Rushikulya sea turtle rookery where in local youths from fishing villages are practicing a gainful employment by being wildlife and nature guides.

1.7.6.7 Providing basic and advanced equipment

For effective protection, monitoring and communication the forest divisions should be well equipped with basic and advanced equipment. Equipment for the aquatic / marine areas should meet the specific needs.

A tentative list of equipment could be – binoculars, spotting scope, camera traps, camera, range finder, GPS receiver, field and map compass, pedometer, densiometer, clinometer / haga altimeter, thermo-hygro-anemometer, sonar depth-finder and fish sounder, tranquilizing equipment and drugs, unmanned aerial vehicle, field gears for rescue teams, fire-fighting equipment such as firefighter shovels, brooms, rakes, portable leaf blowers etc. Thise equipment should be provided to all forest divisions. Fire-fighting equipment should be provided to all forest ranges where forest fire occurs frequently.

1.7.7 Human wildlife conflict management and peaceful co-existence with wildlife

The broad scheme focused on co-existence of human with wildlife and suggested key points for implementation. With about one-third of the state landmass under forest cover, the distribution of wild animals is almost pan-Odisha. The rural and tribal populations living within or adjacent to the forested landscape is resulting in negative human-wildlife interactions or conflicts very regularly. In fact, the human-wildlife conflict in Odisha has resulted in very large number of human and retaliatory elephant mortalities (which is probably third highest in the country). The linear development projects such as railways, highways, irrigation canals, and power transmission lines have also contributed to a significant level of HWC related mortalities.

The state government spends over Rs.14 crores annually towards paying ex-gratia for human deaths, injury, cattle kills as well as house and crop damage by wild animals. From an amount of Rs.2.03 crore given

as compensation to human mortalities due to HWC in the year 2015-16 the amount has gone up to Rs. 2.45 crore in the year 2016-17 due to deaths of 85 persons in conflicts with wild animals.

Human-wildlife conflicts in the state are largely associated with elephants, crocodiles, and sloth bears and is also a big concern for the forest department. Moreover, the snake-bite causality in the state is also high. The forested, coastal-marine and agriculture landscape of Odisha also provides a good habitat for the snake population. The poor rural inhabitants have the most serious interface with the snakes in these landscapes. In fact, between 2015-16 to 2017-18 as many as 1716 snake bite human deaths have been reported by the state particularly in the coastal districts of Balasore, Bhadrak, Keonjhar and the mountainous districts of Mayurbhanj and Ganjam. Most snakebite mortalities occur during the months of May to October - the monsoon period.

The coastal cashew plantations and widespread stone quarries have affected sloth bear habitats and have resulted in high incidences of human-sloth bear conflicts - perhaps the second largest human- wildlife conflict cases in the state. Crop raiding by elephant, wild pig, blackbuck and gaur are of a different nature of human-wildlife conflict having pronounced impact on agriculture and livelihood of people.

The saltwater crocodile and human conflict in Bhitarkanika region are highly location specific but is of a major concern as both human and livestock mortality has been significant. The incidental capture of Olive ridley turtles in mechanised fishing sector is also a cause of concern as the annual mortality of ridley some years exceeds almost 5000 in number. The other HWC concerns are that of human- leopard and human - tiger conflicts.

While the state has a comprehensive HWC relief payment scheme, there are anomalies in the amount of compensation that is paid in respect to carnivore, elephant, crocodile and snake bite mortalities. The time gap of HWC compensation being distributed is also a matter of concern. The preparedness of medical attention and removal of marauding wild animals in the HWC cases are also a matter of attention.

The level of tolerance of people at large of HWC is on the wane as also the peaceful co-existence with wildlife. In this backdrop OSCOW-MAG is recommending the state to keep in place a HWC related program, that addresses the HWC and solution approaches in a more realistic and workable manner. The Standard Operation Procedure (SOP) and guidelines for forest and wildlife staff as to how to address the issue are on hand, but this also requires some policy level interventions.

The guidelines as to how to tackle this problem which are as under:

1.7.7.1 Identification of human- wildlife conflict hotspots in the state

While human-elephant conflict and human-sloth bear conflict locations in the state are quite widespread and the human-crocodile and human-blackbuck conflict location are much localized, it is recommended that based on conflict cases happened over the last decade the human wildlife conflict hotspots in the state be identified and mapped. Based on this HWC maps the concerned forest/wildlife division can have a rapid action team and related infrastructure to deal with such conflict situations; both prior to HWC and post-HWC actions.

1.7.7.2 Problem animal alert network

While sporadic and aberrant behavior of conflict animals require just monitoring and short-term action to drive away such animals. It is the repeat offenders which can be termed as problem animals. Based on the wildlife conflict hotspots and the frequency at which the problem animals operate an animal alert

location can be identified. The problem animal alert location can then contact the nearest veterinary unit if a capture and translocation is required. By creating such network of problem animal locations, a statewide alert network can be created not only to address the problem, at the shortest possible time, but also to enlist the support and cooperation from other.

1.7.7.3 Establishment of Rapid Action Team in HWC hotspots with infrastructure at divisional level

It is recommended that an emergency HWC response team (HWCRT) should be put in place in divisions / circles with high number of HWC hotspots. The recommended HWCRT should consist of forest officer not below the rank of ACF, Range Forest Officer (RFO), a wildlife trained veterinarian, a local police officer and a minimum of 5-6 young energetic and able-bodied frontline staff with community representation. If possible, this should also have support of a mobile vet system. The veterinarian should have chemical capture equipment.

1.7.7.4 Nuisance animal management programme (Capture and translocation)

It is recommended that the state may imitate a new "Nuisance animal management program". This will include an emergency response team, a crowd control and management unit, a vet care, capture and translocation infrastructure and personnel. Such a nuisance animal management unit be located and be at the disposal of a forest circle. Depending on the gravity of HWC issues and hotspots the circle may have more than one such unit.

1.7.7.5 Ex-gratia /compensation scheme review and rationalization

It is important to recognize that the ex-gratia and the compensation scheme based financial support to the victims need to be reviewed at a time interval of 3 years, as the overall expenditure of the medical care and such other requirements tend to increase annually. Further, if the victim was the only livelihood earning member of the family, the nearest kin member of the family be provided with some employment opportunity with the forest department or any other department under that district administration.

1.7.7.6 Insurance scheme

It is also recommended to explore the possibility of bringing the livestock, agriculture crop and the property of the human-wildlife conflict area hotspot under insurance scheme, for which the primary registration and annual premium should be borne by the concerned forest division / state government.

1.7.7.7 Education and awareness drive on HWC (Films, brochures etc.)

In Odisha, most of the HWC associated with loss of human life, livestock, property and crop are associated with elephants, sloth bear, wild pig, blackbuck, crocodile, gaur, snakes etc. Most conflict cases happen during the overlapping time period and season of activities of human and wildlife. In some cases, such as elephants in a new area where elephants were a not a common occurrence, people are not aware how to react. In this background it is important that local people may made aware how to avoid or behave in a situation of human-wildlife conflict. It is recommended that each forest circle be provided with a mobile HWC education and awareness vehicle with films, brochures, with dos and don'ts, other simple interventions, that can reduce the possibilty of HWC. For example, in elephant depredation areas, a buffer cropping of avoidance crop such as chilly and simple electric fence are options, which could be tested with fine tuning as per the local conditions.

Under OSCOW-MAG Standard Operating Procedures for problem species have been drafted, which should be referred to as per the need.

1.7.8 Wildlife crime control and capacity building

The broad scheme focuses on protection of wildlife, located as it is along the Bay of Bengal on to the south and a heavy load of illegal marine fishing, the protected and endangered species of sea turtles, have been the target of wildlife crime in the marine environment of Odisha.

The presence of elephant, tiger, leopard, sloth bear and pangolin all over the state has also made these species a target in the wildlife crime for tusks, skins, nails, gall bladder, scales, bones and other body parts. Surrounded by five other states provide the pathway and easy outflow of illegal wildlife crime products from Odisha to other states and the need for interstate coordination and cooperation cannot be over emphasized.

Odisha is a state with very large population of tribal people who have lived for time immemorial living of the wild. Their "subsistence" level of dependency on wild flora and fauna and traditional hunting practices is illegal and affect the implementation of the Wildlife (Protection) Act, 1972 (WPA). Moreover, the strength of the enforcement staff has been small and the support infrastructure to control the wildlife crime was inadequate.

The biodiversity rich eastern ghats, the Bay of Bengal, Similipal forests, Chilika lake and network of riverine and other wetlands provide the backdrop on which the wildlife crime depends on. In the recent years the growth of human settlement in rural and wild landscape has been one of the reasons of increasing human-wildlife conflict which often leads to retaliatory killing of wild animals in the state. Organised wildlife crime for elephant tusks, carnivore skin and bones, pet trade for turtles and birds (Hill Myna) etc. have come to the fore once in a while and the forest department has risen to the occasion to face them. The support of the judiciary in punishing the crime perpetuators have been rather slow and portrayal of wild animal in a negative perspective has also contributed to the cause. Besides, change in modus operandi of the wildlife criminals and the change in trend of demand for specific wildlife product necessitates updating the knowledge and skills of the forest department staff and equip them to efficiently handle the challenges.

In this background, the OSCOW-MAG project recommends the state government to initiate a new wildlife crime control program with some broad generic guidelines as to how to tackle this problem which are as under:

i. The state should have a central wildlife crime monitoring cell which should collate minimum ten years of wildlife crime related offense records of the state on a secured server with secured access. The data should be analysed and used for enforcement and wildlife crime prevention activities.

ii. Special Task Force (STF) to monitor wildlife offenses should be formed as a part of CWLW Office and should be headed by an ACF / DCF with proven investigation capabilities. This unit also should have circle level teams headed by an ACF reporting to the central team directly. The STF should have statewide jurisdiction and to be supported with operational and administrative resources.

iii. Across the state, frontline staff should undergo wildlife crime prevention training under a systematic plan. From every forest division, interested staff with knack of investigation and enforcement should attend wildlife crime prevention training which should have a minimum of three-days' module.

iv. Each division should appoint a qualified and trained legal expert who will provide assistance and guidance to the investigation officers and also assist the public prosecutors in trial courts.

v. Recruitment of frontline staff should be done to ensure that more than 80% of the staff strength in the wildlife areas are filled within one year and the remaining vacant posts have to be filled within next three years.

vi. All licenced firearms owned by people within 10 km radius of the PAs should be registered with the Chief Wildlife Warden as per the provisions of the Wildlife (Protection) Act, 1972.

vii. Research on impacts of traditional hunting by tribal should be done by biologist and sociologist to initiate the process and plans to reduce such hunting pressure on the wildlife.

viii. Research needs to be undertaken to study conflict situations and suitable measures should be devised to reduce the impact of conflicts on wildlife.

ix. Under education and awareness schemes of the state forest department, education programs should be initiated for school and college students living near wildlife areas on various aspects of conservation especially wildlife crime prevention and timely reporting.

1.7.9 Trans boundary wildlife management and coordination

The broad scheme focused on trans boundary wildlife management and coordination followed by recommendations on improvement. Odisha state shares borders with five other states i.e. West Bengal, Jharkhand, Chhattisgarh, Telengana and Andhra Pradesh. On to the north and north-east, the Baripada forest circle shares its boundary with Medinipur circle of West Bengal and Gumla circle of Jharkhand. The Rourkela circle shares its borders with Gumla circle of Jharkhand in north, Sarguja circle of Chhattisgarh on to north-west and Bilaspur circle on to west. The Sambalpur circle shares its borders with Bilaspur circle and Raipur circle on to the west. The Bhawanipatna circle shares border only with Raipur circle of Chhattisgarh. It is the Koraput forest circle which shares the boundary with six different circles of three different states, which are Raipur circle, Kanker circle and Jagadhalpur circle of Chhattisgarh, Khammam circle of Telengana, and Rajmundry and Vishakhapatnam circle of Andhra Pradesh. The coast-based Berhampur circle shares its interstate boundary with the Vishakhapatnam circle of Andhra Pradesh.

The sharing of the boundary with five different states has its own problems with respect to illegal transit of forest and wildlife materials and trans-boundary movement and migration of wild animals - particularly elephants. Important forest and wildlife habitat are also contiguous with the neighboring states requiring protection and management coordination and cooperation.

In this background, it is recommended that, the state of Odisha may initiate a state level trans boundary coordination and cooperation scheme under the chairmanship of Chief Wildlife Warden and the six regional CCF of forest circle as members to conduct regular review and interaction meetings among themselves and with the respective circle chiefs of the neighboring states.

Table: 1.7.9.1 Interstate trans-boundary forest circle of Odisha and the adjoining states.

Forest Circles of Odisha	Adjoining Forest circles of the neighboring states	Trans-boundary problems related to forest and wildlife requiring coordination and cooperation
Baripada	1. Medinipur Circle (West Bengal) 2. Gumla Circle (Jharkhand)	1. elephant migration 2. poachers crossing borders and any other

Rourkela	1. Gumla Circle (Jharkhand) 2. Sarguja Circle (Chhattisgarh) 3. Bilaspur Circle (Chhattisgarh)	1. elephant migration 2. poachers crossing borders 3. Polluting rivers due to mining 4. Left Wing Extremism (LWE) and any other
Sambalpur	1. Bilaspur Circle (Chhattisgarh) 2. Raipur Circle (Chhattisgarh)	1. poachers crossing borders 2. polluting rivers due to mining 3. left-wing extremism (LWE) and any other
Bhawanipatna	1. Raipur Circle (Chhattisgarh)	1. trans-boundary movement of important wild animals (tiger and wild buffalo) 2. left-wing extremism (LWE) and any other
Koraput	1. Raipur Circle (Chhattisgarh) 2. Kanker Circle (Chhattisgarh) 3. Jagadalpur Circle (Chhattisgarh) 4. Khammam Circle (Telengana) 5. Rajahmundry Circle (Andhra Pradesh) 6. Vishakhapatnam Circle (Andhra Pradesh)	1. forest fire 2. tribal hunting of wild animals 3. slash and burn cultivation 4. illegal wildlife trade 5. human-wildlife conflict
Berhampur	1. Vishakhapatnam Circle (Andhra Pradesh)	1. elephant movement 2. illegal wildlife trade 3. human-wildlife conflict 4. left-wing extremism (LWE)

1.7.9.1 Recommended inter and intra state coordination and cooperation mechanism

It is suggested that the interstate coordination committee meeting consisting of the forest circles of Odisha and the neighbouring states be organised at Bhubaneswar under the chairmanship of the CWLW, Odisha at least once a year. The chief of the Wildlife Crime Control Bureau (WCCB), the IGF (Wildlife), MoEF&CC and Chief of MoEF&CC's regional office should be a special invitee.

The agenda for such a meeting should be the following.

i. To review the existing and emerging issues of forest and wildlife consensus in the interstate boundary
ii. To share amongst the participants how these issues are currently being addressed
iii. To exchange best practice managements in trans-boundary areas adopted by states and replicated in other circles
iv. To keep in place a mechanism of contacts, coordination and cooperation between the forest circles of the state and neighboring states
v. To prepare a catalogue of forest/ wildlife crime/offender database for exchange amongst the neighboring circles and states
vi. Prepare an action plan for reducing the traditional hunting of wildlife and other such practices
vii. To constitute a special task force to deal with organised wildlife crime in the trans boundary areas

1.7.9.2 Inter-state regional meeting

It is also suggested that regional interstate trans-boundary forest circle meetings be organised at least twice a year having a representative of WCCB and representative from the MoEF&CC's regional office in the region. Indicative list of agenda points is in the previous section.

i. Vishakhapatnam for Berhampur and Koraput circles of Odisha with the participation of Chief of Vishakhaptnam Circle, Rajahmundry Circle, Khammam Circle.

ii. Raipur for Sambalpur, Koraput and Bhawanipatna circles of Odisha with the participation of Raipur circle, Kanker Circle, Jagadalpur Circle and Bilaspur Circle

iii. Ranchi for Rourkela and Baripada circles of Odisha with participation of Medinipur Circle (West Bengal), Gumla Circle (Jharkhand) and Sarguja Circle (Chhattisgarh)

1.7.9.3 Intra-state regional meeting

The CWLW of Odisha will hold a meeting, at least twice a year, of the circle chiefs, invited key personals from other enforcement agencies (WCCB), state police and other line departments and representative from the MoEF & CC's regional office.

1.7.10 Research and monitoring for wildlife management

The broad scheme focused on Research and monitoring for wildlife management and suggested key points for improvement. Since the creation of wildlife wing of the Odisha Forest department, the two focus areas of research in wildlife have been the crocodiles and marine turtles. In fact, if one searches of published information on the two taxa of the state of Odisha, the research conducted by the researchers from the state project and outsourced organization such as Wildlife Institute of India (WII) comes to the fore. This has been the case, since Odisha had dedicated research officers for crocodile research and sea turtle research. The three full-time research officers, who were employed by the Odisha Forest department during the mid to late 70's have since been superannuated. However, when they were in service, they have also facilitated research by other National Institutes such as CMFRI, WII, IISc and also by the universities of the state such as Utkal University, North Orissa University, Berhampur University, Sambalpur University and also OUAT.

The other two species that can be brought into the list of research in Odisha have been the tiger by the researchers of WII and elephant by IISc group led by Prof. R. Sukumar. The other taxa group on which some focused researches have taken place was the herpetofauna largely led by Dr. S.K. Dutta and the group from Utkal University.

The Chilika Lake has been the research area of the BNHS and the CDA and has contributed some significant bit of research on avifauna.

The MS Swaminathan Research Foundation (MSSRF) has contributed to research of mangroves of Bhitarkanika which is noteworthy. However, the in-house research capabilities of the forest and wildlife department have been rather slow due to lack of proper guidance and methodological approaches. The facilitation of outsourced research to professional external agencies has given the state a much better result.

In this background OSCOW-MAG project recommends that the Odisha Forest Department keep in place a new program for wildlife research suggest the following generic guidelines for facilitating and implementing research on wildlife.

i. There is an urgent need to budget for research grants in the annual budget of the Forest Department, and to make giving away such grants an annual event.

ii. Any research priority matrix for management of PAs should be flexible and evolving and should only guide and not dictate research. PA management can encourage research in priority areas through incentives such as funding, facilities and other logistics.

iii. It is important to have spatial as well as temporal (e.g. monitoring) spread for basic and applied research.

iv. Given the national and global importance of basic research in understanding ecological and biological processes, such research should be encouraged as much as possible.

v. Research should be 'outsourced' to researchers and professional institutions, and that every PA should develop long-term linkages with such institutions.

vi. Monitoring or periodic measurement of same set of parameters over long periods of time in the light of some anticipated changes can often be a research project and need not have any implications of the PAs in question.

vii. Have Research Officers who would bridge between researchers and forest managers to dovetail the research findings into management plans rather than just end up as publications.

viii. Forest Department can interact with agencies (e.g. India Biodiversity Portal) to make the data pool created by various research projects accessible to the public.

1.7.11 Wildlife education, interpretation and awareness strategy and action plan for Odisha under the program

The broad scheme focused on Wildlife education, interpretation and awareness strategy followed by action points for improvement. Odisha is endowed with vastly forested and non-forested natural wilderness areas which harbor a rich repository of biodiversity-some of which are common to many regions of other states but many are very specific and special to the state of Odisha such as the Chilika Lagoon, marine turtle mass nesting beaches, saltwater crocodile and mangrove areas etc. While some understanding of their occurrence and values for biodiversity support and therefore for tourism, education and other use exists in general to the visitors to Odisha. People who live further away from such resources are not aware of their importance and values due to lack of a proper interpretation, education and awareness program.

In recent years, the state tourism department has embarked on projecting such locations to the outside world based on their wildlife, biodiversity and other unique values for promoting tourism. The state forest and wildlife department has also identified some 30+ ecotourism destinations besides the protected area network. The State Biological Park at Nandankanan attracts some 35 lakh visitors annually and the PAs such as Similipal, Bhitarkanika, Chandaka, Nalabana etc. also attracts significant number of visitors. It is however, important to understand whether the visitors go back from such destinations fully satisfied and educated and more importantly as possible friends of the wildlife of the state. The education, awareness and interpretation programmes in Protected Areas and outside the Protected Areas of the state require a relook and re-planning in a phased manner for significant improvement from what exists today for the visitor resource values of these areas are to be safeguarded for a sustainable eco-tourism and wildlife experience. The manifold potentials of these locations and their values can be further enhanced by adoption of a new state level "PRAKRUTI JAN-JAGARUKATA" programme so as to generate local employment as also catering to the requirements of an increasing number of wilderness destination visitors to the state. The suggested action plans for implementing program are as under:

i. It is recommended that the forest and wildlife department initiate target specific nature and wildlife interpretation education programme which should include the following:

   a. Setting up of theme based Interpretation and Education centres in all protected areas of the state targeted at the general visitors. Upgrade the existing visitor centres in PAs and develop new interpretation centres where they do not exist. Also plan at least 10 such facilities outside the PAs but in areas that have significant wildlife values such as Rushikulya Rookery, Betnoi blackbuck area, Chandipur Horse-shoe crab area, Mangalajodi Bird area, Anshupa Lake area etc. Each forest circle can provide locations where such informative interpretation centres can be established.

   b. Keep in place several mobile educations, awareness and outreach vans that can reach out to regions away from the protected areas and areas that have impacts of human wildlife conflict such as wildlife corridors.

   c. Initiate dialogues with the state education department to include "nature education and awareness chapters' in the school curriculum and text books to make wildlife education and awareness part of the formal education process.

   d. Organise setting up of Nature Clubs surrounding the PAs and organise “Nature Camps” in protected areas targeting the school teachers and students as is being done in the state of Gujarat. For this to happen, it is suggested that a few officers from the state wildlife department visit the state of Gujarat and experience the model that is being implemented there successfully over several decades.

   e. Produce nature education and awareness related brochure, posters, booklets on themes such as species, habitats, conservation actions, practices, problems etc. and make specific provisions to make them reach out to the targeted audiences rather than making them remain in the state capital or the circles and division headquarters.

ii. Interact with the State Biodiversity Board, Regional Plant Resource Centre (RPRC) to include a wider means and varieties of interpretation material (e.g. plants, orchids, cacti etc.) as well as to reach out to a wider landscape of target audiences in the human dominated landscape, cultural landscape, sacred groves and wetland ecosystems.

iii. Create a publicity department in the wildlife organisation to take across the media/message matrix of nature education and awareness to possible wider targets including the print and electronic media.

iv. Liaise with conservation NGOs and organisations to harness their talent and human resources to implement the Prakruti Jan-Jagarukata action plans and programmes.

v. Set up a world class "Sea Turtle Interpretation Centre" at Rushikulya rookery to be jointly managed by the local community youths and the forest department staff since this is not a Protected Area and the local people have made enough sacrifices for making this rookery known to the world as it is today. A model exists in Bundaberg in the form of the ‘Mon Repos Turtle Interpretation Centre’ managed by the villagers and the Department of Environment of Queensland government in Australia.

vi. Explore the possibility of financing the "PRAKRUTI JAN-AJAGARUKATA" through the new Bio-Fin approach of the MOEF&CC of the Government of India as also through the support from the Corporate Social Responsibility (CSR) funds from big corporates operating in Odisha such as the IOCL, Port Trusts, Tata Steel, SAIL, Vedanta, NALCO, IRE and such other corporates.

vii. Create the positions of "Nature Education Officers" for each Interpretation and Education Centres of the PAs and non-PAs. The officers should be trained at the Centre for Environmental Education, Ahmedabad.

viii. Organise a national level workshop of FD officials, NGOs, wildlife enthusiasts, researchers, school and college teachers, media persons, text book writers and such other people to pick and develop and produce "education and outreach materials" for different target groups, to be used at least for a period of 2 to 3 years.

ix. Youths from villages around the PAs may be selected and trained as nature guides for tourists. This can follow the model that is being used in Uttarakhand for the Corbett Tiger Reserve. Also, the local villages are supported to develop homestays and such other livelihood generating options that can help infrastructures. Some of the models have been given in the tourism thematic chapter of the OSCOW-MAG.

x. The Forest Department need to strengthen its communication, education and public awareness strategy with specific actions defined in Aichi Target.

1.7.12 Standard Operating Procedures for dealing with wild animals

Under the OSCOW-MAG a list of SOPs were proposed, the SOPs are 1. Rescue and Placement of Temporarily Displaced Wildlife, 2. Animal Rescue During Disasters, 3. Responding To Snake Bite Emergencies, 4. Handling Cases of Snakes Found In Human Dominated Areas, 5. Chemical Capture of Free Ranging Wild Animals, 6. Transportation of Captured Wild Animals, 7. Investigating Wildlife Deaths, 8. Addressing Impact of Linear Infrastructures on Wildlife, 9. Addressing Marine Megafauna Stranding, 10. Dealing With Emergencies Arising During Arribada and Sporadic Nesting Events of Olive Ridley Sea Turtles, 11. Human - Tiger Conflict, 12. Human - Sloth Bear Conflict, 13. Human - Leopard Conflict Management, 14. Managing Human – Monkey Conflict Scenarios, 15. Human-Crocodile Conflict Management, 16. Managing Human – Elephant Conflict Scenarios, 17. Managing Human – Nilgai Conflict Scenarios and 18. Managing Human – Wild Pig Conflict Scenarios.

1.8 Circle Specific Regional Wildlife Management Plan (RWLMP)

Basing upon the suggestions of Odisha State Comprehensive Wildlife Management Guidelines (OSCOW-MAG) and circle specific requirements, the concerned RCCFs formulated Annual Plan of Operations and submitted for approval before the PCCF (WL) & CWLW, Odisha with all details like physical, financial outlays and location, etc. further the same were approved after scrutiny and in the Annual Plan of Operation 2022-23, expenditure of Rs. 6.68 crore has been made out of National Authority (CAMPA) approved fund of 15.0 crores. In the APO 2023-24 out National Authority (CAMPA) approved fund of 20.0 crores, expenditure of 19.75 crores has been made and for the APO-2024-25 an amount of Rs. 95.00 crores have been approved by the National Authority (CAMPA).

1.9 Comprehensive action plan

The action points under the 10-point strategy of the Comprehensive action plan have been incorporated for preparation of this plan. Comprehensive Action Plan is prepared by Joint Task Force for Conservation of Elephants & Mitigation of Human-Elephant Conflict in Odisha. For Conservation of Elephants & Mitigation of Human-Elephant Conflict the whole state is divided in to zones for effective implementation of action points under the 10-point strategy.

The details of the action points are described in brief for depicting a broad idea about the Comprehensive Action Plan. The Comprehensive Action Plan consists of 10 thematic pillars having 17 long term action points, 19 medium term action points and 158 short term action points for achieving the aim. The 10 thematic pillars are Human-elephant conflict mitigation, Inter-departmental co-ordination, Protection, enforcement and prosecution, Elephant habitat, corridors and connectivity, People's participation, education & awareness, Habitat management for increased productivity, Human resource management & capacity building, Wildlife health management and disease control, Research & application of technology and, Monitoring.

1.9.1 Human-elephant conflict mitigation

Under the thematic pillar "Human-elephant conflict mitigation" with an objective to strengthen coordination with stakeholders/line departments which is being done at various levels, it is proposed to constitute an Advisory and Monitoring Committee on Human Wildlife Conflict chaired by the Chief Secretary, Odisha. Which shall meet Once every six months. The work of the state level committee is to render advice, monitor periodically and enhance inter-departmental co-ordination in the State to address human-wildlife conflict issues.

In the division level it is proposed to prepare one Human Elephant Conflict Management Action Plan with an aim to ensure zero conflict-induced casualty of humans, elephants and minimize damage to crops and property. While preparing the plan it is proposed to ensure all vulnerable villages to be mapped therein, making the plan broadly compatible with the overall goals of elephant conservation in the state and the mitigation plan of the adjoining divisions.

The present mechanism of disbursing compassionate grants using the 'Anukampa' app has resulted in a quick turnaround time. It is emphasized that the functioning of the app needs to be given wide publicity among local people and the existing issues (cases of encroached land, absentee owners, tenant cultivators etc.) have to be eliminated to ensure complete user satisfaction. The divisions to ensure training staff of Jana Seva Kendra for filling up of Anukampa applications. It is proposed to have one revolving find at Division level similar to the District Red Cross Fund from where emergency compassionate payment can be made for emergency compassionate payments resulting from cattle kills, property damage or crop loss as a result of Human-Wildlife Conflict (HWC) along the lines of existing norms for payment in cases of human death. The DFOs are entrusted to ensure other eligible Government schemes available in other line departments to the person facing losses on a priority basis.

It is also proposed to Strengthen the existing Early Warning Systems for early detection and warning of elephants' movements using mobile phones, Bulk SMS, Radio Program, Tower Lights, ANIDERS, Public Announcement for quick communication. It is also proposed for Strengthening of existing preventive measures such as High Mast Lights, Solar Lights in edges of villages, provision of LED/solar chargeable torch lights to villagers, community grain bins, paddy harvesters, underground grain bins, steel storage bins etc.

Rapid Response Teams (including staff trained in tranquilization) were operationalized in 18 strategic locations at the circle level to reduce response time of forest department staff during emergency situations arising due to incursion of elephants into human habitations/cultivation or other animal at distress, the Rapid Response Team is proposed to operationalize in all the 51 divisions.

It is proposed to identify strategic locations where barriers (trenches/solar fences/stone walls) have to be deployed to prevent incursion of wild elephants to human settlement/cultivations. These have to be planned after due thought, ground-truthing and should not be counter-productive. It is emphasized to promote solar

fencing, using the recently launched Jana Surakhya Gaja Rakhya (at individual level and in community level) in all vulnerable areas with specific instruction for making it compatible with the landscape, zonal approaches of elephant conservation. It is also proposed to use of portable (removable) solar power fences which has been found to be effective in Sri Lanka can be tried out on a pilot basis in selected areas.

Strengthening of existing Elephant Rescue Centres at Kumarkhunti (Chandaka) and Kapilash with provision of Tranquilization and Rescue Teams and Veterinarians is proposed along with establishment of new such facilities at Sambalpur, Rourkela and Baripada circles. Training of existing departmental elephants and mahouts for use as kumkis during elephant depredation, patrolling and radio-collaring operations. Technical expertise from other states (W.Bengal, Karnataka, Madhya Pradesh, Assam) etc. may be sought and recruitment of Kumki elephants from Karnataka is also proposed. An Action Plan at each circle having scattered elephant population is proposed for capture and translocation (or retention in captivity as may be decided by the CWLW) of problematic elephants from the conflict prone areas including development of necessary logistics, staff roles and clear prior identification of possible release sites.

To improve existing inter-state coordinating mechanisms, RCCF of Circles having inter-state movement of elephants have been assigned to conduct periodical meetings with his/her counter-part of the neighboring state before the migration season to ensure inter-state co-operation and prevent erection of unnecessary obstructions/barriers and indiscriminate driving operations. It is also proposed to have a consultation meeting once a year to discuss the interstate movement of elephants and common issues relating to elephant management CWLWs of the adjoining elephant-bearing States of the East-Central landscape.

Strengthening of Circle-level Veterinary facilities by having Mobile Veterinary Units in Keonjhar, Angul, Sambalpur and Bhubaneswar Circles to address capture and relocation of elephants and other wildlife is also proposed under this thematic pillar.

1.9.2 Inter-departmental co-ordination

Under the thematic pillar Inter-departmental co-ordination t is proposed to constitute District level Human Wildlife Conflict Mitigation Committee under chairmanship of Collector which shall meet in each month to discuss about issues pertaining to Human Wildlife Conflict and possible solution with Superintendent of Police and heads of relevant line departments. In the similar line it is proposed to conduct monthly Wildlife Crime Prevention and Enforcement meeting with Superintendent of Police to discuss issues on the topic. In both the cases it is proposed to send the minutes of meeting to the Wildlife Headquarters through concerned RCCFs for monitoring on above issues. For control of Mob during straying of elephants to human settlement it is proposed to strengthen existing mechanisms of crowd control by preparing a mob/ crowd control plan to in vulnerable areas with the help of District Administration and Police Department. Enforcement of Section 144 CrPC to be done in warranting situations. Under the plan it is reiterated to enhance co-ordination with local police officials for apprehending habitual and repeat offenders, request for CDR and TDR, call tracking and cracking down on illegal arms manufacturing units as well as booking of offences under Arms Act and Explosive Substances Act.

In the matters pertaining to Railway, it is proposed to conduct regular co-ordination meetings with officials of various Zones of Indian Railways (East coast Railway, South Eastern Railway, S.E Central Railway) at appropriate levels in periodical manner. It is emphasized on effective functioning of elephant squads already deployed to track the movement of elephants near railway lines by ensuring night patrolling using experienced, well-equipped, trained and skilled staff. Strengthening of 24x7 Railway Control Rooms functioning in Khordha Road,

Sambalpur and Bandhamunda with deployment of trained forest staff for ensuring seamless transmission of elephant movement information from the field to prevent accidental train hits is prioritized in this plan. To discourage the movement of wild animals especially elephants it is proposed to install solar fencing along railway lines at vulnerable locations the fencing is to be done after careful thought, ground-truthing and joint verification with Railways in places where absolutely required, side barriers should be done in both sides and never on one side alone. Similarly watch-towers to be erected in sites adjoining railway lines where they are absolutely required. It's emphasized in this plan to stop dumping of food waste/municipal waste in forested areas near railway lines. The Railways have fixed fluorescent signages along the railway tracks to alert the loco pilots in many locations, further it is proposed to identify all the vulnerable locations for fixing of additional signages. It is also proposed to fix large reflectors along the track for reflecting train headlights to alert elephant herds so that they will avoid crossing the tracks. It is proposed to use prefabricated materials during construction of overpass/under pass for animal and restricting the time of construction from 6 AM to 6 PM for causing non hinderance in animal movement.

In the matters pertaining to Roads & Highways, it is proposed to conduct regular co-ordination meetings with officials of National Highways Authority of India (NHAI) and State Public Works Departments to review progress of mitigation projects and discuss prevention of accidents in periodical manner. Fixing signages on additional crossing points, maintenance of existing signages, reposting of signages from non-use points to new points, expediting construction of over passes and under passes as well as emphasizing on use of existing over passes and under passes are on priority. Emphasis is given for regular patrolling on highways by Highway Squads at vulnerable elephant crossing locations, to alert the commuters on elephant movement as well as facilitate crossing of the road by the elephants. In other linear projects it is proposed to conduct special drive to mitigate impact of canals by ramps/bridges and wherever present, examination of their efficacy. In case of inappropriate design leading to non-use it is proposed to rectify the same.

Under this plan it is suggested to work in co-ordination with Department of Agriculture & Farmers' Empowerment and Fisheries & Animal Resources Development Department which in return will help in exploring the possibility of change in crops/cropping pattern in order to reduce elephant conflict in pilot projects in select localities (Short duration crops such as millets/ Elephant-repellent crops such as Chilly, Ginger etc.) and promotion of innovative agro-horticulture, high yielding, stall-fed livestock rearing, poultry, pisciculture to promote livelihood of local people and offset their losses due to traditional paddy cultivation.

Special focus is given in this plan on preventing accidental & deliberate electrocution of elephants under which Regular co-ordination meetings with Energy Dept./DISCOMs, frequent patrolling by DISCOMs in vulnerable locations to check illegal looking, identifying and mapping vulnerable points of electrocution in each Division (Sagging lines/ tilted poles/ interposing poles where required/ habitual hooking villages) and updating the same in periodical manner, enforcing provisions of electricity act., capacity building of local staff of DISCOMs, technical upgradations on provisions like installation of efficient MCBs in all the substations, insulation of 11KV & LT lines passing through forest areas along with exploring ways for feasibility of underground transmission lines inside Pas having dense elephant population, dismantling of defunct electrical structures, fitting of spikes on electric poles and barricading of substations/unprotected transformers, lift irrigation points in forest and forest fringe and other vulnerable areas, Joint patrolling of Forest and Energy Department staff along vulnerable stretches of transmission lines in elephant movement areas and villages prone to illegal hooking by GPS mounted vehicles, sharing of trip record immediately by electricity department to Forest, Environment and Climate Change Department, Capacity building of DISCOM staff for identifying illegal hooking are

proposed. In most of the electrocution deaths of elephants it is seen that the death of elephant happens accidentally while coming into contact with charged wires kept for wild pigs, either for crop protection or poaching, whose population has grown in many areas. Scientific and legal ways of controlling the population of wild pigs to be explored and implemented in a site-specific and transparent manner drawing from similar examples in other states. Local villagers also to be sensitized to not deploy such traps.

1.9.3 Protection, enforcement and prosecution

Under the thematic pillar Protection, enforcement and prosecution it is proposed to Form dedicated, trained and physically fit 'Elephant Tracking Teams' in conflict and poaching-prone divisions to closely follow, track, monitor and photograph elephants. They should be ideally drawn from local tribal villagers who have an innate sense of jungle craft. These ETTs should be separate from routine protection squads. To augment the number of Protection Squads in particularly vulnerable areas physically fit, motivated local youths to be engaged and to be provided with adequate training, periodic drills and equipment for achievement of the objective along with effective monitoring of their works.

It is proposed to Strengthen the functioning of the Elephant Protection and Wildlife Crime Control Cell for daily monitoring of adult tuskers, inter-divisional movement and predictive early warning for crop depredation, wildlife crime prevention, investigation and prosecution with special emphasis on developing intelligence networks, arresting habitual offenders and timely prosecution of ongoing cases aiming to achieve significant proportion of conviction. It is reiterated to develop independent, diffused and effective intelligence networks at all levels and even at the level of individual officers. Allotment of secret funds made for this to be closely monitored. Actionable intelligence from the field leading to crime prevention should be the key aim.

It is emphasized to ensure strengthening of functioning of 24x7 Control Room at HQ, Circle and Division levels, functioning of Toll-free number at Circle and WLHQ and give wide publicity regarding the same. Preparation of Criminal Data base and Criminal Dossier at State HQ /Circle HQ, maintenance of Surveillance register (phone / presence) of habitual/repeat offenders, Wildlife & Forest Offence Meeting to discuss & review pending investigation and trial case, special efforts to arrest absconder, preparation of Wildlife Crime Risk Maps and Wildlife Protection Plan covering spatial and temporal extent of wildlife crime within the division, regular foot patrolling and night patrolling (Random and Surprise) by staff, RO, ACF & DFO along afore-mentioned poaching/crime hotspots, extensive touring and night halts covering all vulnerable areas of poaching by supervising officers in the field are emphasized along with inter-divisional and joint-divisional patrolling in vulnerable areas as well as joint Protection Camps in bordering areas of divisions under the strict supervision of Concerned RCCFs. It is suggested to prepare a comprehensive plan about availability of protection infrastructure such as Protection Camps/Anti-Poaching Barrack/ Staff Quarter/ Watch tower etc. in each division, especially in 'no-man's land' along divisional boundaries aiming at saturation of the above infrastructure.

Elephant Proof Barriers (Elephant Proof Trench/ Stone Wall Guard/ Solar fencing) to be erected as per Site Specific Action Plan. Existing ones to be renovated for efficacy and wherever defunct and not required to be filled or removed. To be carefully deployed after proper ground-truthing and should not be counter-productive. While selecting sites, special attention to be given to ensure that traditional movement paths, paths to water sources etc. are not blocked or elephants diverted to nearby areas. RCCFs to carefully analyze and monitor.

Effective use of VHF network with maintenance of VHF register in the Circle, Division and Range HQs, Monitoring of effective deployment of Vehicles (including GPS Mounted) for protection and anti-depredation duty, Deployment of Drones (including night vision and IR-camera mounted) in vulnerable areas and also on routes used by criminals, installation of CCTV cameras in check gates and vulnerable entry gates, use of concealed Trap Cameras (including IR-enabled ones) along suspected routes used by poachers are also emphasized under this thematic action point.

Close monitoring of use of Apps like OFMS/ M-Stripes and iWLMS for detection of Wildlife offence cases, provision for insurance coverage for members of Anti-poaching Squads and other frontline staff in case of any eventualities during patrolling, financial incentive in case of wildlife offence detection to informer/ Sources by amendment of the Act (Odisha Reward for detection of) Forest Offence Rule, 2004, Effective use of Secret Fund to maintain a wide and effective intelligence network, Establishment of close co-ordination with the Wildlife Forensic Laboratory of the Wildlife Institute of India so as to decrease the turn-around time for receiving reports on samples sent as part of evidence in wildlife crimes, Provision of MoU for use of facilities of State Forensic Science Laboratory for collection of scientific evidence in wildlife crime cases and establishment of Wildlife Crime Forensic Laboratory at Nandankanan with technical aid from Wildlife Institute of India are also emphasized under the plan.

1.9.4 Elephant habitat

Under the thematic pillar Elephant habitat and sub-theme Rationalizing and securing Elephant Habitats corridors and connectivity it is proposed to adopt a zonation approach of the state based on habitat quality and viability, elephant use and movement, spatial configuration of forest fragments and corridors, human population, developmental imperatives, pattern and degree of human-elephant conflict. Accordingly, a draft zone of Divisions and Ranges has been suggested in the plan for implementation the zones in the plan are categorized to Zone 1: Elephant Conservation Zone, Zone2: Elephant-human Co-existence Zone, Zone 3: Conflict mitigation Zone, Zone4: Elephant Removal (or Exclusion) Zone.

Under the sub-theme Connectivity between habitats, it is proposed to have a connectivity map in each division showing wildlife crossing points and crucial cross-over sites between forest patches earmarked for mitigation, it is specified that in cases of presence of linear infrastructure fragmenting the habitat its mitigation measures to be provided and in all new linear infrastructure projects an animal passage plan to be provided and in mining districts, parking of trucks in vulnerable elephant crossing areas during night time to be designated as no-parking zones and signages to be erected as it hampers smooth crossing of elephants.

Under the sub-theme Identification and protection of elephant corridors it is proposed to commission at least a year-long (1-2 years) study covering all seasons by a national institution to assess the functionality and feasibility of the 14 identified elephant corridors and the additional corridors mentioned in the ANCF report of 2018. After identification, it is proposed to have a Corridor Management Plan to chalk out and implement interventions in each corridor including erection of signages on each elephant corridors. Under the sub-theme spreading of awareness among stakeholders in elephant corridor areas it is proposed to carryout awareness programs for various stakeholders to create awareness and garner public support by involving students of schools and colleges as well as other civil societies.

Under the sub-theme removal of encroachment in corridors& consolidation it proposed to evict illegal settlements/land-use in government areas, promotion of Wildlife-friendly land-use to be in case private

lands, purchase of land wherever feasible and voluntary relocation of people to whom rights/individual titles have been granted under FRA, 2006.

Under the sub-theme regular monitoring of elephant corridors, it is proposed to involve local people in monitoring of use of elephant corridors and regulation of Road/railway traffic passing through elephant corridors, especially at night. Under the sub-theme Inter-state consultative meetings, it is proposed to conduct State level consultative meetings to discuss issues pertaining to movement of elephants across inter-state elephant corridors and under the sub-theme work closely with other agencies it is proposed to work with NTCA to identify elephant corridors that overlap with tiger corridors to jointly secure these corridors.

1.9.5 People's participation, education & awareness

Under the thematic pillar People's participation, education & awareness it is proposed to constitute core committee to enhance people's participation in wildlife conservation in every division consisting of Honorary Wildlife Warden, NGOs, PRI Members, EDC & VSS members, local influential people, Local MLAs& MP.

Framing and adopting precautionary measures (Do's & Don'ts) by local people during incursion of elephants into villages/ Crop Fields and its wide circulation, use of vernacular language in both audio-and audio-visual mode, conducting formal meetings emphasizing attempt to achieve 'zero accidental death of elephant and human beings' in conflict prone ranges, screening of short duration film narrating need for protection and conservation of elephant along with mitigation methods of human-elephant conflict in vulnerable villages frequently, exhibition of Rural Folk song / Religious song / Street plays, campaign by social media, Poster / Signage / wall painting, mass media communication methods and other such awareness methods involving local villages, PRI members, VSS & EDC members as well as Gaja Sathi volunteers.

For enhancing people's participation help of civil society bodies, NGOs to be involved. Formation of volunteer group of villagers to in villages acutely affected by Human-Elephant conflict spear-headed by Gaja Sathis, roping in community / individuals to participate in the Jan Surakhya Gaja Rakhya scheme as well as documentation of all good practices and successful case studies in human-elephant conflict mitigation for replicating them in other divisions are prioritized, building of toilets in all households under 'Swachh Bharat' mission, especially in areas frequented by elephants to sensitize people to use their toilets instead of going to the fields to attend call of nature and use of innovative eco-tourism practices to watch and photograph elephants at a pilot level to aid income generation and to foster a sense of ownership among the villagers are also prioritized.

1.9.6 Habitat management for increased productivity

Under the thematic pillar Habitat management for increased productivity and sub theme stratifying elephant habitats, it is proposed to stratify elephant habitats beats into Good, Medium and Poor elephant habitats based on forage, water, cover and disturbance. It is proposed to identify areas that are intact elephant habitats with a map showing all prominent habitat features including water bodies, dense and open forests, meadows and grassland etc. for delineating key elephant habitats.

Under the sub-theme Improving Elephant Habitat it is proposed to develop habitats with a holistic habitat 'restoration' approach instead of piece-meal approach wherein clearly identified degraded patches (5-25 hectares or more) to be continuously managed in the long-term taking advice of experts, mapping of extensive weed-infested areas [emphasizing on most obnoxious species such as Chromolaena odorata, Mikania micrantha, Cassia tora, Lantana camara] in all divisions and ear marking area for weed

eradication by developing a five year action plan with plan for sowing/planting with palatable species of grasses, herbs/forbs, shrubs, and fruit/fodder trees. In all Regional Wildlife Management Plans, Site Specific Wildlife Management Plans, it is proposed to have at least 25% funds ear-marked for habitat improvement. In all plantation drives within elephant rich RFs (Zone I&II), it is proposed to have at least 50% of planting material from the list of elephant food plants and other elephant movement areas at least 20% to be planted. Following wildlife-friendly norms specified in the Wildlife Conservation (Overlapping) Working Circles prescribed in the Working Plans while undertaking forestry operations, avoiding routine climber-cutting, bush-clearance, roadside clearance etc., restoration of degraded meadows by site-specific strategies and restoration of degraded/blank patches by enrichment plantations of fodder/food species are also proposed. In divisions having high elephant population it is emphasized to have a specific chapter for elephant conservation and management. In mining area restoration plan focus on wildlife and habitat restoration including planting of bamboo and elephant food plants as well as appropriate water conservation and harvesting structures are emphasized.

Under the sub-theme Plantation of Bamboo, Ficus and preferred elephant food plants it is emphasized to raise extensive bamboo plantations, improvement of degraded bamboo forests, discouragement of bamboo shoot (karadi) collection by local people from forests in elephant bearing areas with plan for adequate supply of bamboo rhizomes for planting in private areas for self-sufficiency along with alternative livelihood plan for habitual karadi collectors. Planting of Ficus species especially Ficus bengalensis in all suitable areas with due protection in addition, preferred elephant food trees with attempt to assist germinations on snags/dead woods and developing captive fodder farms near elephant rescue centres as well as in divisions having captive elephants are also emphasized.

Under the sub-theme water sources and other habitat improvement measures, development of water resources in carefully chosen areas by catchment treatment plans and development of soil moisture conservation structures as per contour, elevation and precipitation are emphasized aiming at saturation. Reducing the presence of scrub cattle and livestock in elephant areas, and periodical disinfection of water sources are emphasized. Under the sub-theme forest fire management and control it is proposed to adhere to the fire management and control measures in a meticulous manner prioritizing the fodder rich areas and plantations.

1.9.7 Human resource management & capacity building

Under the thematic pillar Human resource management & capacity building filling up of vacancy positions at all levels of regular frontline and supervisory staff, designation of a Prosecution Range Officer in each Division for constant liaison with the Courts, effective prosecution and timely filing of PRs, prescribed subject capacity building of frontline staff, Creation of adequate number of posts of Veterinarians within the Forest Department considering their crucial role in wildlife health management, rescue and rehabilitation, Capacity building of Gaja Sathis, Civil Society (VSS members/ Community Groups), Mahouts, Veterinarians, Supervisory Forest staff, thematic short-term training programme on HEC mitigation for Forester and Forest Guards are proposed.

Nomination of Range Officers for 3-month and ACF, DCF for 10-month certificate diploma course in WL management course in the Wildlife Institute of India (WII), inclusion of Wildlife Management, Wildlife Health Monitoring and Human-Elephant Conflict (HEC) mitigation in the syllabus of induction training conducted for all the forest staff, recommendations to include Wildlife Health, Rescue and Rehabilitation as a Special Paper in the syllabus of the degree course in Veterinary Sciences are emphasized.

Training and awareness of sub-divisional and district level judicial officers on the gravity of wildlife crime, illegal wildlife trade and role of Forest Department in tackling these., training and awareness of sub-divisional and district level police officers on the gravity of wildlife crime, illegal wildlife trade and their role in supporting Forest Dept in apprehending habitual wildlife criminals, tackling menace of illegal fire-arms etc., training and awareness of Loco Pilots, linemen and Level-Crossing staff to prevent accidents involving elephants, training and awareness of Medical Officers, Tahsildars and IICs for quick processing of compassionate payment claims for human death, recognizing exceptional services of civil society members, forest staff, other department staff and proposal for award are discussed.

1.9.8 Wildlife health management and disease control

Under the thematic pillar Wildlife health management and disease control, it is proposed to conduct preventive vaccination of domesticated animals in forest fringe area against vaccine preventable diseases such as Hemorrhagic septicemia (HS), Black Quarter (BQ), Anthrax and Foot and Mouth Disease (FMD), Animal Disease Surveillance on commonly occurring diseases of domesticated animals and birds and physical surveillance on wild elephants.

Strengthening of Centre for Wildlife Health with modern diagnostic facilities and adoption of new technologies for easy and quick diagnosis of disease of wild animals. Enable its recognition as a recognized Forensic Laboratory, Disinfection of water bodies within forest areas preferably before and after monsoon, Treatment of sick / injured wild elephants adhering to SOPs, Conducting Post Mortem (PM) examination of dead wild elephants and scientific collection of morbid materials for laboratory examination by a team of local Veterinarians and Control of Emerging Diseases in wild elephants are also proposed.

1.9.9 Research & application of technology

Under the thematic pillar Research & application of technology it is proposed to Fill up the existing vacancies of Research Officers in the State Wildlife Headquarters, to develop a Research & Monitoring cell having at least two research scholars in each circle, to strengthen GIS cell of each division and circle for preparing and updating detailed land-use, land cover maps regularly, to undertake periodic elephant population estimation following standard protocols in collaboration with Project Elephant and a National Institution of repute, to strengthen close monitoring of elephant herds by trackers, supplemented by photographs/videos by drones/IR drones/cameras to realistically estimate sex/age-class distribution so as to decipher demographic parameters and trajectory of population change.

To commission a study covering both the wet and the dry seasons to assess the status of identified corridors including new corridors listed by Asian Nature Conservation Foundation, to carryout Radio-collaring studies in select localities of the State to elucidate habitat use, ranging and patterns of crop depredation, to take up pilot project to assess efficacy of various types of barriers on a pilot basis (community solar fences, rubble walls, steel channel/rail bars etc.), use of camera traps for understanding elephant presence, habitat use and individual identification of tuskers, to take up pilot project.

Use of emergent technology including ground impact detection sensor technology/temperature and movement sensors etc. to detect and give early warning of presence of elephants, especially on identified crossing points across railway tracks, to take up pilot projects on the use and efficacy of low-cost bio-deterrents such as chilly bombs, use of bee-boxes, elephant-repelling crops, lure crops as well as acoustic deterrents (bee-sound, tiger roars) etc. which have been tried across the country, to study peoples' perceptions on HEC and people's participation involving social scientists / organisations, to commission study on the use of linear infrastructure mitigation measures such as Elephant Underpasses and Overpasses in selected divisions are emphasized.

It is proposed, to carryout studies for understanding social carrying capacity, the changing trends in human tolerance and traditional co-existence between elephants and local people in select landscapes involving reputed local universities, to study on elephant habitat quality with special reference to palatable tree, shrub, climber and grass species, meadow management practices with an aim to improve (One each in Mayurbhanj, Mahanadi and Sambalpur Elephant Reserves).

It is also proposed to conduct disease surveillance and monitoring in all elephant reserves and PAs with elephants, to establish long-term ecological monitoring stations to assess bioclimatic variables using automatic data loggers in all Pas along with assessment of stream flow, soil profiles etc. to assess ecosystem services evaluation, to go for AI-based Intrusion Detection System (IDS) which has been already deployed by Northern Frontier Railway (NFR) in Lumding and Alipurduar divisions in selected stretches in Odisha and exploring similar other technologies like Intelligent Seismic Sensing System for Elephant Movement Detection (eleSeisAlert) being developed by CSIR-Central Scientific Instruments Organisation (CSIO), Chandigarh and open-source sensor warning system EleSense-IoT for pilot-level implementation.

1.9.10 Monitoring

Under the thematic pillar Monitoring it is proposed to, strengthen daily monitoring and regular analysis of iWLMS/OFMS/mSTRIPES data at Division and Circle levels for effective protection / patrolling strategy for preventing elephant deaths, map the movement of elephant herds/solitary tuskers regularly at division and circle level for taking proactive steps for their protection, ensure sharing of monthly compiled report on movement of elephants in prescribed format to state level by concerned circles with specific observations/comments of RCCFs for effective monitoring, ensure monitoring of smaller and scattered population by the circle-level Committees constituted under the chairmanship of Chief Wildlife Warden and suggesting steps for safety and security of those elephants.

It is proposed to expedite the radio collaring of candidate animal (adult tusker, matriarchs, solitary males, captured individuals to be released back) in select localities of the state in line with the MOU signed between PCCF (WL) & CWLW, Odisha with Indian Institute of Science, Bangalore, to ensure preparation of photographic profile of tuskers and its further refinement in all elephant bearing divisions by vetting at the Circle level to provide protection and prevent poaching, carryout analysis of sex/age-class break-up of elephant herds through periodic monitoring for arriving at indicative growth rates and demographic trajectory.

1.10 Inference

Based upon the general prescriptions given in Odisha State Comprehensive Wildlife Management Guidelines (OSCOW-MAG) and conflict mitigation strategies under the Comprehensive Action Plan (CAP) there is a need to implement a Circle level, landscape approach plan for the activities which are not covered under any other plan. The plan shall suggest recommendations for protection of wild animals outside the protected area network, improvement of habitats, wildlife estimation and census exercises, species specific conservation plans, wildlife health management, community based wildlife conservation programmes, developing IEC on wildlife management, wildlife crime control, long-term research and development, staff welfare measures and many other landscape specific activities which is essential for management of the wildlife. Hence, it is felt necessary to study the Strength, Weakness, Opportunity & Threat (SWOT) to analyze the same at each and every division level for all the 51 divisions of the state of Odisha so as to design the 10-year plan for the whole state.

Divisional level SWOT Analysis and Gap Identification

CHAPTER 2

ANGUL CIRCLE

Angul Forest Division

STRENGTH

- Part of Satkosia Tiger Landscape & Mahanadi Elephant Reserve
- Good quality forested habitat
- Functional RRT
- Functional MVU
- Intensive elephant monitoring Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Good Coordination among Tata Power, Railways & Forest Dept.
- Dossier of every solitary elephants/tuskers

WEAKNESS

- Habitat degradation due to mining & change in land use
- Increase in human death & injury due to WL conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Scientific planning of solar
- fencing
- Capacity building of RRT, MVU, Squad & Field staff
- Relocation of identified tuskers.

THREAT

- Unplanned solar fencing Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures
- Mining in elephant habitat
- Frequent public agitation
- Higher numbers of Solitary tuskers in the division
- Elephant conflict in Cashew field , Mango orchard & Palm plantations

Athgarh Forest Division

STRENGTH

- Part of Satkosia Tiger Landscape & Mahanadi Elephant Reserve
- Good quality bamboo & miscellaneous forest habitat for WL
- Intensive elephant monitoring Good Coordination among Tata power, Railways & Forest Dept.
- Anukampa application
- processing
- Functional elephant movement zone across River Mahanadi
- Large stretch of Riverine habitat suitable for Gharial.
- Skimmer, Black bellied tern etc.
- Ansupa Lake, Chhatisapata Wetland

WEAKNESS

- Habitat degradation due to industrial units
- Linear infrastructures like Railway, NH/ SH & canals fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level

OPPORTUNITY

- Divisional level RRT & MVU team for managing HWC
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures Implementation of SSWLCP prescriptions in & around industrial units
- Strengthening of electrical infrastructure
- Capacity building of Squad & Field staff
- Restoration of Ansupa Wetland, scientific monitoring of Chhatisapata Wetland
- Prosecution of Wildlife Criminals
- Gharial, Skimmer, Black bellied Tern, Fresh water turtle conservation

THREAT

- Organized poaching of elephants
- Illegal hooking & faulty distribution network of Tata power
- Railway, NH & other road infrastructures
- Industrial units in elephant habitat
- Elephant conflict in Cashew field , Mango orchard & Palm plantations
- Anthropogenic disturbances in Indian skimmer breeding area

Athamallik Forest Division

STRENGTH

- Part of Satkosia Tiger Landscape & Mahanadi Elephant Reserve
- Good quality forested habitat
- Functional RRT
- Functional MVU
- Intensive elephant monitoring Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Good Coordination among Tata Power, Railways & Forest Dept.
- Dossier of every solitary elephants/tuskers

WEAKNESS

- Habitat degradation due to mining & change in land use
- Increase in human death & injury due to WL conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Scientific planning of solar
- fencing
- Capacity building of RRT, MVU, Squad & Field staff

THREAT

- Unplanned solar fencing Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures
- Mining in elephant habitat
- Frequent public agitation
- Higher numbers of Solitary tuskers in the division
- Elephant conflict in Cashew field , Mango orchard & Palm plantations

Cuttack Forest Division

STRENGTH	WEAKNESS
▪ Connected to elephant habitat of Kapilash WLS & Khuntuni Range of Athgarh ▪ Good quality forested habitat ▪ Intensive elephant monitoring ▪ Proactive community engagement in fire protection, forest & WL conservation ▪ Good Coordination among Tata power, Railways & Forest Dept. ▪ Dhaltangarh spotted deer conservation initiative.	▪ Habitat degradation due to mining & change in land use ▪ Linear infrastructures fragmenting the WL habitat ▪ Increase in Crop damage due to Monkey, Elephant and Wild pig ▪ Large scale vacancy in FG level

OPPORTUNITY	THREAT
▪ Habitat improvement ▪ Wetland management ▪ Retrofitting of linear infrastructures ▪ Implementation of SSWLCP prescriptions in mining areas ▪ Strengthening of electrical infrastructure ▪ Fresh water turtle conservation and heronry management	▪ Akhand Shikar in few pockets ▪ Railway, NH & other road infrastructures ▪ Mining in elephant habitat

Dhenkanal Forest Division

STRENGTH

- Part of Satkosia Tiger Landscape & Mahanadi Elephant Reserve
- Good quality forested habitat
- Functional RRT
- Functional Veterinary Unit
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation under OFSDP-2
- Good Coordination among Tata power, Railways & Forest Dept.
- Elephant Transit Centre at Kapilash

WEAKNESS

- Habitat degradation due to industrial units & change in land use
- Increase in human death & injury due to WL conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Scientific planning of solar fencing
- Capacity building of RRT, MVU, Squad & Field staff
- Development of Kapilash Zoo
- Upgradation of Elephant Rescue Centre

THREAT

- Unplanned solar fencing
- Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures
- Mining & industrial units in elephant habitat
- Frequent public agitation
- Higher numbers of Solitary tuskers in the division
- Elephant conflict in Cashew field, Mango orchard & Palm plantations
- Bait / pressure bomb threat to WL

Satkosia Forest Division

STRENGTH

- Part of Core & Buffer zone of Satkosia Tiger Reserve Landscape & Mahanadi Elephant Reserve
- Good quality forested habitat
- High density of Leopard & prey in core area
- Functional MVU
- Proactive EDCs & community engagement in fire protection, ecotourism, forest & WL conservation
- Gharial conservation initiative
- Voluntary Village relocation
- Meadow management
- Bird Survey
- Indian skimmer conservation

WEAKNESS

- No evidence of tiger for last few years
- Linear infrastructures fragmenting the WL habitat
- Large scale vacancy in FG level
- Lack of mobile network
- Lack of staff hostel in Angul HQ
- No incentives for staff working in isolated interior camps

OPPORTUNITY

- Habitat improvement
- Retrofitting of linear infrastructures
- Strengthening of electrical infrastructure
- Scientific planning of solar fencing
- Capacity building of MVU, Squad & Field staff
- Tiger reintroduction
- Elephant habitat improvement
- Camp & Road infrastructure
- Fishermen community engagement
- Gharial Recovery Programme
- Village Relocation

THREAT

- Unplanned solar fencing
- Illegal hooking & faulty distribution network of Tata power
- Road infrastructures
- Poaching of WL
- Antagonism with local villagers

Mahanadi Forest Division

STRENGTH

- Part of Core & Buffer zone of Satkosia Tiger Reserve Landscape & Mahanadi Elephant Reserve
- Good quality forested habitat
- High density of Leopard & prey in core area
- Proactive EDCs & community engagement in fire protection, ecotourism, forest & WL conservation
- Gharial conservation initiative

WEAKNESS

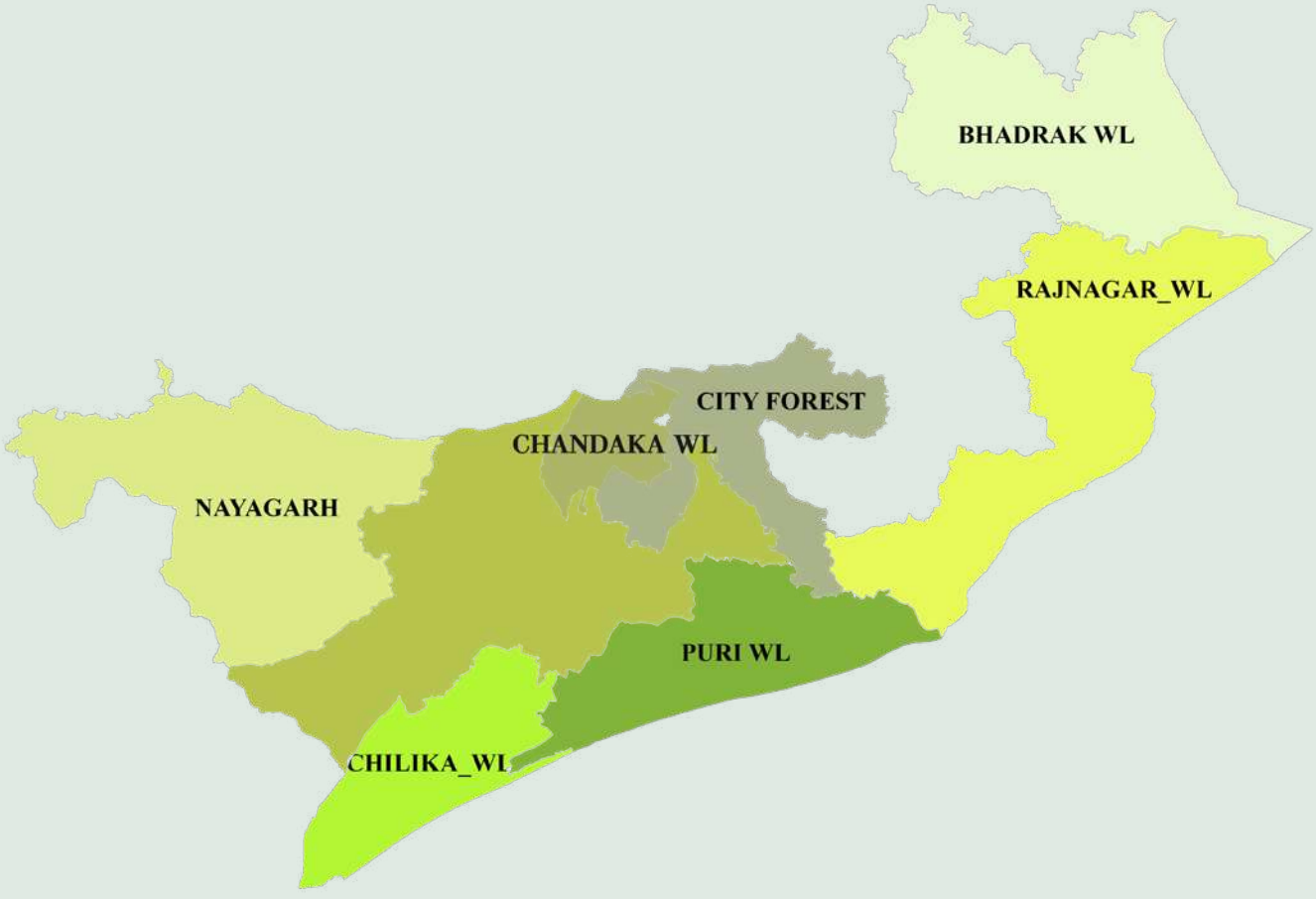
- No evidence of tiger for last few years
- Linear infrastructures fragmenting the WL habitat
- Large scale vacancy in FG level
- Lack of mobile network
- Lack of staff hostel in Nayagarh HQ
- No incentives for staff working in isolated camps

OPPORTUNITY

- Habitat improvement
- Retrofitting of linear infrastructures
- Strengthening of electrical infrastructure
- Capacity building of MVU, Squad & Field staff
- Tiger reintroduction
- Elephant habitat improvement
- Camp & Road infrastructure
- Hill myna, Gaur conservation initiative

THREAT

- Road infrastructures
- Poaching of WL



BHUBANESWAR CIRCLE

Nayagarh Forest Division

STRENGTH	WEAKNESS
▪ Adjacent to Satkosia Tiger Landscape & Mahanadi Elephant Reserve ▪ Good quality forested habitat ▪ Intensive elephant monitoring ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Good Coordination among Tata Power, Railways & Forest Dept.	▪ Linear infrastructures fragmenting the WL habitat ▪ Increase in Crop damage due to Monkey, Elephant and Wild pig ▪ Large scale vacancy in FG level ▪ Forest fire incidences in WL habitat

OPPORTUNITY	THREAT
▪ Habitat improvement ▪ Retrofitting of linear infrastructures ▪ Strengthening of electrical infrastructure ▪ Capacity building of Squad & Field staff ▪ Blackbuck & Mugger conservation initiative	▪ Illegal hooking & faulty distribution network of Tata Power ▪ Railway, NH & other road infrastructures ▪ Elephant conflict in Cashew field, Mango orchard & Palm plantations ▪ Poaching of WL

Bhadrak Forest Division

STRENGTH	WEAKNESS
▪ Olive ridley mass nesting site ▪ Salt water crocodile habitat ▪ Irrawaddy dolphin habitat ▪ Mangrove forest	▪ Lack of adequate protection measures for WL protection ▪ Illegal fishing & trawler activities in WL habitat

OPPORTUNITY	THREAT
▪ Streamlining of Olive ridley protection ▪ Monitoring of Salt water crocodile and dolphins	▪ Illegal trawling and fishing in Olive ridley, dolphin habitat ▪ Human-salt water crocodile conflicts in monsoon ▪ Encroachment of mangrove forest

Khordha Forest Division

STRENGTH	WEAKNESS
▪ Good quality forested habitat for elephants ▪ Intensive elephant monitoring ▪ Good Coordination among Tata Power, Railways & Forest Dept.	▪ Habitat degradation due to infrastructural development & change in land use ▪ Increase in human death & injury due to WL conflicts ▪ Linear infrastructures fragmenting the WL habitat ▪ Increase in Crop damage due to Elephant and Wild pig ▪ Large scale vacancy in FG level

OPPORTUNITY	THREAT
▪ Streamlining of Anukampa application processing ▪ AI/ML based WL surveillance ▪ Habitat improvement ▪ Retrofitting of linear infrastructures ▪ Implementation of SSWLCP prescriptions in mining areas ▪ Strengthening of electrical infrastructure ▪ Scientific planning of solar fencing ▪ Arachandi wetland conservation	▪ Illegal hooking & faulty distribution network of Tata power ▪ Railway, NH & other road infrastructures ▪ Fragmentation of Chandaka- Khordha elephant migration route ▪ Elephant conflict in Cashew field, Mango orchard & Palm plantations ▪ Poaching of WL

City Forest Division

STRENGTH	WEAKNESS
▪ Less no of Human Wildlife Conflicts	▪ Crop damage due to langur & macaque

OPPORTUNITY	THREAT
▪ Gharial conservation initiative	▪ Sporadic cases of elephant migration

Chandaka Forest Division

STRENGTH	WEAKNESS
▪ Good quality forested habitat ▪ Functional RRT ▪ Elephant Transit Camp ▪ Intensive elephant monitoring ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Good Coordination among TPCODL & Forest Dept.	▪ Habitat degradation due to mining & change in land use ▪ Linear infrastructures fragmenting the WL habitat ▪ Increase in Crop damage due to Monkey, Elephant and Wild pig ▪ Large scale vacancy in field staff

OPPORTUNITY	THREAT
▪ AI/ML based WL surveillance ▪ Habitat improvement ▪ Retrofitting of linear infrastructures ▪ Implementation of SSWLCP prescriptions in mining areas ▪ Strengthening of electrical infrastructure ▪ Capacity building of RRT, Squad & Field staff ▪ Gaur reintroduction ▪ Prey augmentation ▪ Various Nature interpretation activities ▪ Indian skimmer conservation ▪ State level WL training center development	▪ Encroachment ▪ Illegal hooking & faulty distribution network of TPCODL ▪ NH & other road infrastructures ▪ Mining in elephant habitat ▪ Frequent public agitation ▪ Higher numbers of migratory elephants in the division ▪ WL poaching

Chilika Forest Division

STRENGTH	WEAKNESS
▪ Chilika as Ramsar Wetland ▪ Unique migratory bird congregation site ▪ Collaboration with different reputed scientific organisation ▪ Nalabana WLS ▪ Internationally acclaimed wetland management unit ▪ Second largest lake of the country ▪ Largest brackish water lake of India	▪ Siltation ▪ Illegal prawn cultivation ▪ Invasive species ▪ Water pollution ▪ Unregulated Dolphin Tourism ▪ Weeds ▪ Unsustainable habitat use

OPPORTUNITY	THREAT
▪ Migratory bird protection, monitoring ▪ Management of habitat in Nalaban Wildlife Sanctuary ▪ Nature based tourism ▪ Scientific monitoring of vital parameters ▪ Regulated tourism ▪ Irrawaddy Dolphin Species specific conservation ▪ Olive ridley nest protection and management ▪ Bird flu & other pandemic surveillance ▪ Nature interpretation initiatives ▪ Sea grass monitoring ▪ White bellied Sea eagle monitoring and conservation	▪ Encroachment ▪ WL poaching ▪ Illegal fishing and prawn culture

Puri Forest Division

STRENGTH	WEAKNESS
▪ Balukhand WLS for protection of coastal & beach flora and fauna ▪ Sporadic nesting of Olive Ridley ▪ Presence of Dolphin the territorial water ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Puri Blue flag beach ▪ Community based ecotourism ▪ Coastal Shelterbelt Plantations ▪ Meadow management inside Balukhand WLS	▪ Habitat degradation of Balukhand WLS ▪ Linear infrastructure & fringe villages around Balukhand WLS ▪ Unregulated beach tourism ▪ Inadequate Marine Protection Squad, equipment & speed boats

OPPORTUNITY	THREAT
▪ Habitat improvement ▪ Retrofitting of linear infrastructures ▪ Implementation of SSWLCP prescriptions in and around Balukhand WLS ▪ Blackbuck reintroduction ▪ Various Nature interpretation activities ▪ Intensive protection of Olive Ridley ▪ Protection of migratory birds ▪ Restoration of sand dune, nesting beach and management of Heronry ▪ Conservation and monitoring of White bellied Sea eagle	▪ Encroachment ▪ NH & other road infrastructures ▪ WL poaching

Mangrove Forest Division

STRENGTH

- Large PA network consisting of Bhitarkanika NP & WLS, Gahirmatha Marine WLS & Ramsar site
- Largest mangrove forest of the state
- Highest no of salt water crocodile population
- Largest Arribada site for Olive Ridley Turtles in the country
- Largest heronry of the state
- Highest no of Dolphins in the state
- Important habitat for migratory birds
- Collaboration with different reputed agencies
- Wetland health cards

WEAKNESS

- Pressure from fringe villages on the Marine Protected areas
- Human – Salt water crocodile conflict
- Presence of Ports, Industrial units & IT, Chandipur
- Illegal fishing & trawling in Protected areas
- Large scale crop damage due to wild pig & monkeys
- Illegal prawn gherry
- Inadequate no of marine protection speed boats & trawlers
- Inadequate perimeter fencing & safe bathing ghats

OPPORTUNITY

- AI/ML based WL surveillance
- Habitat improvement
- Implementation of SSWLCP prescriptions in protected areas
- Scientific monitoring of Mangrove ecosystem
- Capacity building of Crocodile rescue unit, Squad & Field staff
- Batagur baska reintroduction
- Prey augmentation
- Various Nature interpretation activities
- Fishing cat & other small carnivore conservation
- Mangrove Interpretation center
- Population Management of salt water Crocodile
- Nesting bird monitoring and conservation of threatened bird
- Migratory Shorebird monitoring

THREAT

- Human mortality due to crocodile attack
- Encroachment
- Illegal prawn gherry
- WL poaching
- Negative impact of Industrial unit & ports
- Upstream migration of Salt water
- crocodiles in monsoon
- Illegal fishing & trawling in protected areas

Nandankanan Zoological Park

STRENGTH

- Luxuriant and varied biodiversity over a small patch of forest land.
- Presence of Kanjia lake and Kiakani lake to support the biodiversity of the area.
- Ameliorative potential of the area to provide recreational facilities to visitors.
- Potential of the area to work as an excellent field for research studies in Forestry and Wildlife.
- Prospect of the area to function as a centre of education on forests, wildlife and wetlands.
- An appropriately designed administrative structure to guarantee unique mix of in-situ and ex-situ conservation.
- Manpower with expertise and experience in the field of wildlife conservation.
- Scientifically designed and regularly updated management plan & master plan.
- Strong backing and funding from the Government.
- National & international recognition for wildlife conservation efforts.
- Well equipped animal care and veterinary facilities.
- Established visitor amenities.
- Sustainable practices in the field of wildlife conservation.

OPPORTUNITY

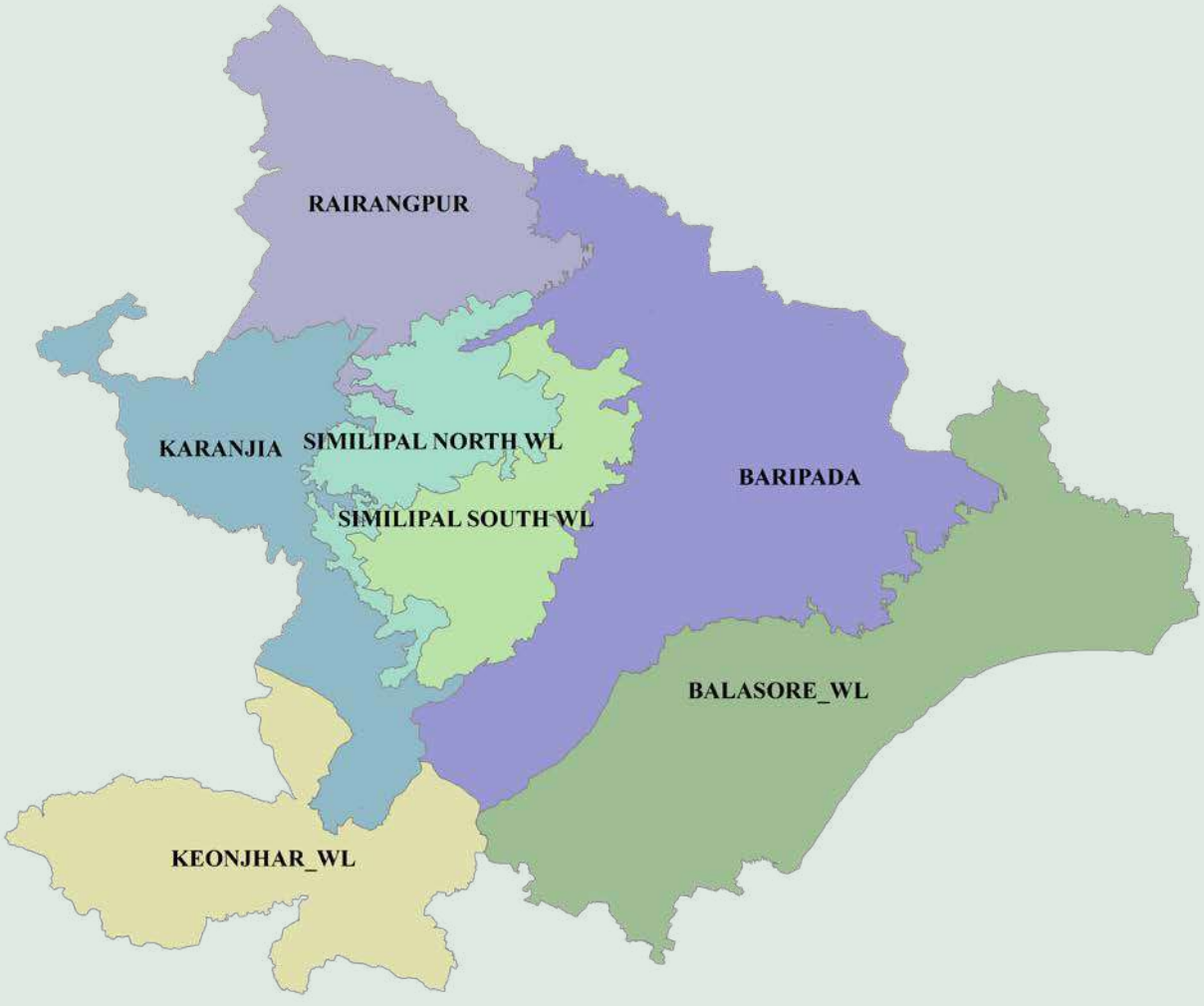
- Excellent customer service enhancing visitor satisfaction.
- Conservation breeding of rare and endangered species.
- Conservation education through planned education activities.
- Socio economic development of the local communities.
- Capacity building towards biodiversity conservation.
- Research on biodiversity.
- Rescue and rehabilitation of wild animals.
- Collaboration in the field of wildlife conservation with national/international organizations.
- Sustainable water management practices in Kanjia & Kiakani lake.
- Effective disaster mitigation measures.
- Modern state of the art exhibits.
- Promoted sustainable practices.
- Enhanced protection network.
- Technological advancements in wildlife management.

WEAKNESS

- Thoroughfare for local villagers existing within the park.
- Lack of sufficient staff strength.
- Insufficient support from the local community.
- Inadequate facilities to cope with natural disasters.
- Insufficient professionally trained staff.
- Inadequate waste management facilities.
- High operational cost.
- Inadequate visitor facilities during peak tourist days.

THREAT

- Risks from Natural disasters-cyclones, floods etc.
- Risk of zoonotic diseases, pandemics.
- Negative perception among visitors on animal captivity.
- Risks from vandalism, theft and other security breaches.
- Unpolished visitors towards wildlife conservation.
- Vulnerability of forest areas towards encroachment.



BARIPADA CIRCLE

Baripada Forest Division

STRENGTH

- Part of Similipal Tiger Landscape & Mayurbhanj Elephant Reserve
- Good quality forested habitat
- Functional RRT
- Functional MVU@Baripada
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Good Coordination among Tata Power, Railways & Forest Dept.
- Established mechanism of Inter state coordination for elephant monitoring
- Conservation reserve status for functional WL corridor
- JTF/STPF/Similipal Strike Force operating in the landscape

WEAKNESS

- Habitat degradation due to mining, invasive weed & change in land use
- Increase in human death & injury due to WL conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Capacity building of RRT, MVU, Squad & Field staff
- Surveillance of Similipal fringe villagers for protection of Similipal Tiger Reserve
- Ring vaccination against important livestock diseases
- Monitoring of WL dispersal from Similipal Tiger Reserve
- Management of Migratory Elephant

THREAT

- Illegal hooking & faulty distribution network of TPNODL
- Railway, NH & other road infrastructures
- Mining in elephant habitat
- Higher numbers of inter-state migratory elephants in the division
- Extremely high no of Human-Elephant conflict in winter season

Rairangpur Forest Division

STRENGTH	WEAKNESS
▪ Part of Similipal Tiger Landscape & Mayurbhanj Elephant Reserve ▪ Good quality forested habitat ▪ Intensive elephant monitoring ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Good Coordination among Tata Power, Railways & Forest Dept. ▪ Established mechanism of Inter state coordination for elephant monitoring ▪ JTF/STPF/Similipal Strike Force operating in the landscape	▪ Habitat degradation due to mining, invasive weed & change in land use ▪ Increase in injury cases due to elephant & sloth bear conflicts ▪ Linear infrastructures fragmenting the WL habitat ▪ Increase in Crop damage due to Elephant, monkey and Wild pig ▪ Large scale vacancy in FG level ▪ Higher numbers of Forest fire incidences in WL habitat. ▪ Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY	THREAT
▪ AI/ML based WL surveillance ▪ Habitat improvement ▪ Retrofitting of linear infrastructures ▪ Implementation of SSWLCP prescriptions in mining areas ▪ Strengthening of electrical infrastructure ▪ Capacity building of Squad & Field staff ▪ Surveillance of Similipal fringe villagers for protection of Similipal Tiger Reserve ▪ Ring vaccination against important livestock diseases ▪ Monitoring of WL dispersal from Similipal Tiger Reserve	▪ Illegal hooking & faulty distribution network of Tata power ▪ Railway, NH & other road infrastructures ▪ Mining in elephant habitat ▪ Higher numbers of inter-state migratory elephants in the division ▪ higher no of Human-Elephant conflict in winter season

Karanjia Forest Division

STRENGTH

- Part of Similipal Tiger Landscape & Mayurbhanj Elephant Reserve
- Good quality forested habitat
- Functional RRT
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Good Coordination among TPNODL, Railways & Forest Dept.
- Protection of functional WL corridor with Keonjhar WL
- JTF/STPF/Similipal Strike Force operating in the landscape

WEAKNESS

- Habitat degradation due to mining, invasive weed & change in land use
- Increase in human death & injury due to WL conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Capacity building of RRT, Squad & Field staff
- Surveillance of Similipal fringe villagers for protection of Similipal Tiger Reserve
- Ring vaccination against important livestock diseases
- Monitoring of WL dispersal from Similipal Tiger Reserve

THREAT

- Illegal hooking & faulty distribution network of TPNODL
- NH & other road infrastructures
- Mining in elephant habitat
- Higher numbers of inter-state and inter division migratory elephants in the division
- Extremely high no of Human- Elephant conflict in winter season

Balasore Forest Division

STRENGTH

- Part of Similipal Tiger Landscape & Mayurbhanj Elephant Reserve
- Good quality forested habitat
- Good Coordination among TPNODL, Railways & Forest Dept.
- Established mechanism of Inter state coordination for elephant monitoring
- Conservation reserve status for functional WL corridor
- JTF/STPF/Similipal Strike Force operating in the landscape
- Few patches of good quality mangrove forest
- Horse shoe crab habitat
- Sloth bear habitat

WEAKNESS

- Habitat degradation due to mining, invasive weed & change in land use
- Increase in human death & injury due to WL conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Capacity building of RRT, MVU, Squad & Field staff
- Surveillance of Similipal fringe villagers for protection of Similipal Tiger Reserve
- Ring vaccination against important livestock diseases
- Monitoring of WL dispersal from Similipal Tiger Reserve
- Management of new conservation reserve

THREAT

- Illegal hooking & faulty distribution network of TPNODL
- Railway, NH & other road infrastructures
- Mining in elephant habitat
- Higher numbers of inter-state migratory elephants in the division
- Extremely high no. of Human- Elephant conflict in winter season

Keonjhar Forest Division, Anandpur

STRENGTH

- Part of Similipal Tiger Landscape & Mayurbhanj Elephant Reserve
- Good quality forested habitat
- Functional RRT
- Functional MVU @ Baripada
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Good Coordination among TPNODL, Railways & Forest Dept.
- Established mechanism of Inter state coordination for elephant monitoring
- Conservation reserve status for functional WL corridor
- JTF/STPF/Similipal Strike Force operating in the landscape

WEAKNESS

- Habitat degradation due to mining, invasive weed & change in land use
- Increase in human death & injury due to WL conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Capacity building of RRT, MVU, Squad & Field staff
- Surveillance of Similipal fringe villagers for protection of Similipal Tiger Reserve
- Ring vaccination against important livestock diseases
- Monitoring of WL dispersal from Similipal Tiger Reserve

THREAT

- Illegal hooking & faulty distribution network of TPNODL
- Railway, NH & other road infrastructures
- Mining in elephant habitat
- Higher numbers of inter-state migratory elephants in the division
- Extremely high no of Human- Elephant conflict in winter season

Similipal North WL Division

STRENGTH

- Part of Similipal Tiger Landscape & Mayurbhanj Elephant Reserve
- Having good numbers of tigers, leopards & prey base
- Well maintained meadow, infrastructure, road, VHF & protection infrastructure
- Successful community based ecotourism model
- Functional habitat connectivity
- Well trained staff
- Good quality forested habitat
- Functional RRT @ Karanjia
- Functional MVU @ STR
- Intensive WL monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- JTF/STPF/Similipal Strike Force operating in the landscape

WEAKNESS

- Habitat fragmentation due to buffer villages
- Large scale vacancy in field level
- Higher numbers of Forest fire incidences in few pockets.
- Lack of mobile network
- Inadequate staff hostel in Jashipur HQ
- No incentives for staff working in isolated interior camps
- Non-operational Mugger Research Centre, Ramatirtha
- Unavailability of Kunki elephants for active WL management
- Illegal Ganja cultivation in non-forest land in buffer villages
- Inadequate vaccination of livestock

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Capacity building of RRT, MVU, Squad & Field staff
- Surveillance of Similipal fringe villagers for protection of Similipal Tiger Reserve
- Ring vaccination against important livestock diseases
- Monitoring of WL dispersal from Similipal Tiger Reserve
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC
- Village relocation

THREAT

- Forest fires in isolated patches
- WL poaching in fringe areas
- Safety of dispersing tigers in the fringe areas

Similipal South WL Division

STRENGTH

- Part of Similipal Tiger Landscape & Mayurbhanj Elephant Reserve
- Having good numbers of breeding tigers, leopards & prey base
- Mostly inviolate core area
- Well maintained meadow, infrastructure, road, VHF & protection infrastructure
- Functional habitat connectivity to other important PAs
- Well trained staff
- Good quality forested habitat
- Functional RRT @ Baripada
- Functional MVU @ STR
- Intensive WL monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- JTF/STPF/Similipal Strike Force operating in the landscape

WEAKNESS

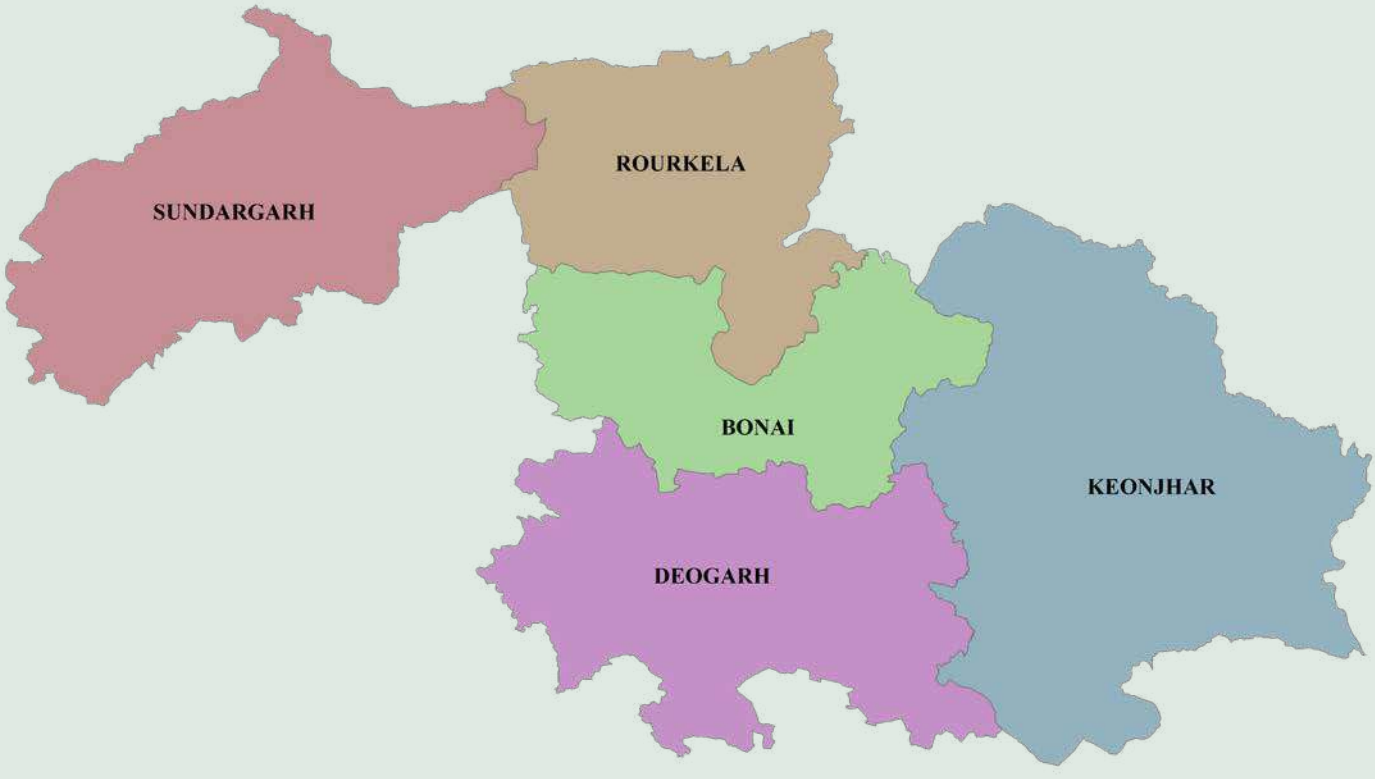
- Habitat fragmentation due to buffer villages
- Large scale vacancy in field level
- Higher numbers of Forest fire incidences in few pockets.
- Lack of mobile network
- Inadequate staff hostel in Baripada HQ
- No incentives for staff working in isolated interior camps
- Unavailability of trained Kunki elephants for active WL management
- Illegal Ganja cultivation in non-forest land in buffer villages & Bakua
- Inadequate vaccination of livestock in the fringe areas

OPPORTUNITY

- AI/ML based WL surveillance
- Habitat improvement
- Capacity building of RRT, MVU, Squad & Field staff
- Surveillance of Similipal fringe villagers for protection of Similipal Tiger Reserve
- Ring vaccination against important livestock diseases
- Monitoring of WL dispersal from Similipal Tiger Reserve
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC
- Scientific management of meadow
- Intensive monitoring of tiger & co-predators, elephant and other prey species
- Relocation of Bakua

THREAT

- Forest fires in isolated patches
- WL poaching in fringe areas
- Safety of dispersing tigers in the fringe areas



ROURKELA CIRCLE

Bonai Forest Division

STRENGTH

- Good quality forested habitat
- Low population density
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Good Coordination among Tata Power,
- Railways & Forest Dept.
- Part of Saranda-Keonjhar-Sundergarh-Bamra-Rourkela landscape
- Presence of large carnivores and prey
- Community managed ecotourism initiatives

WEAKNESS

- Large population of tribals depending on forest for livelihood
- Habitat degradation due to shifting cultivation, mining & change in land use
- Increase in human death & injury due to elephant & sloth bear conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities Scarcity of water in WL habitat during summer
- LWE affected patches
- Lack of mobile network
- Traditional customs of WL hunting

OPPORTUNITY

- Streamlining of Anukampa application processing
- RRT and MVU team at division level
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Scientific planning of solar fencing
- Capacity building of Squad & Field staff
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC
- Reclamation of shifting cultivation & old mines

THREAT

- Shifting cultivation
- Migratory tribal population
- Pollution
- Encroachment & anthropogenic pressure on WL habitat.
- WL poaching
- Forest fires in few pockets
- Degradation due to mining
- Unplanned solar fencing
- Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures
- Mining in elephant habitat
- Frequent public agitation
- Higher numbers of Solitary tuskers in the division
- Elephant conflict in Cashew field, Mango orchard & Palm plantations

Rourkela Forest Division

STRENGTH	WEAKNESS
▪ Good quality forested habitat ▪ Intensive elephant monitoring ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Established mechanism of Inter state coordination for elephant monitoring ▪ Good Coordination among Tata Power, Railways & Forest Dept. ▪ Part of Saranda-Keonjhar-Sundergarh-Bamra-Rourkela landscape ▪ Presence of leopard and prey in good density documented through CT ▪ RRT and MVU team at division level	▪ Habitat degradation due to urbanization, irrigation canal, industry, shifting cultivation, mining & change in land use ▪ Increase in human death & injury due to elephant & sloth bear conflicts ▪ Linear infrastructures fragmenting the WL habitat ▪ Increase in Crop damage due to Elephant, Nilgai and Wild pig ▪ Large scale vacancy in FG level ▪ Higher numbers of Forest fire incidences in few pockets. ▪ Inter-state WL poaching activities & transit of WL articles ▪ Scarcity of water in WL habitat during summer

OPPORTUNITY	THREAT
▪ Streamlining of Anukampa application processing ▪ AI/ML based WL surveillance ▪ Habitat improvement ▪ Retrofitting of linear infrastructures ▪ Implementation of SSWLCP prescriptions in mining areas ▪ Strengthening of electrical infrastructure ▪ Scientific planning of solar fencing ▪ Capacity building of RRT team, MVU, Squad & Field staff ▪ Extensive community engagement and capacity building training for ecotourism, protection and management of HWC	▪ Encroachment & anthropogenic pressure on WL habitat. ▪ WL poaching ▪ Forest fires in few pockets ▪ Degradation due to mining ▪ Unplanned solar fencing ▪ Illegal hooking & faulty distribution network of Tata Power ▪ Railway, NH & other road infrastructures ▪ Mining in elephant habitat ▪ Frequent public agitation ▪ Higher numbers of Solitary tuskers in the division ▪ Elephant conflict in Cashew field, Mango orchard & Palm plantations

Sundergarh Forest Division

STRENGTH

- Good quality forested habitat
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Established mechanism of Inter state coordination for elephant monitoring
- Good Coordination among Tata Power, Railways & Forest Dept.
- Part of Saranda-Keonjhar-Sundergarh-Bamra-Rourkela landscape
- Presence of tiger, leopard and prey in good density documented through CT
- RRT team at division level

WEAKNESS

- Habitat degradation due to urbanization, irrigation canal, industry, shifting cultivation, mining & change in land use
- Increase in human death & injury due to elephant & sloth bear conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities & transit of WL articles
- Scarcity of water in WL habitat during summer

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Scientific planning of solar fencing
- Capacity building of RRT team, Squad & Field staff
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC
- Intensive management of Hemgiri range for Wildlife

THREAT

- Encroachment & anthropogenic pressure on WL habitat.
- WL poaching
- Forest fires in few pockets
- Degradation due to mining
- Unplanned solar fencing
- Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures
- Mining in elephant habitat
- Frequent public agitation
- Higher numbers of Solitary tuskers in the division
- Elephant conflict in Cashew field, Mango orchard & Palm plantations

Keonjhar Forest Division

STRENGTH

- Good quality forested habitat
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Established mechanism of Inter state coordination for elephant monitoring
- Good Coordination among Tata Power, Railways & Forest Dept.
- Part of Saranda-Keonjhar-Sundergarh-Bamra-Rourkela landscape
- Presence of tiger, leopard and prey in good density documented through CT
- RRT and MVU team at division level

WEAKNESS

- Habitat degradation due to urbanization, irrigation canal, industry, shifting cultivation, mining & change in land use
- Increase in human death & injury due to elephant & sloth bear conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities & transit of WL articles
- Scarcity of water in WL habitat during summer

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Scientific planning of solar fencing
- Capacity building of RRT team, MVU,
- Squad & Field staff
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC

THREAT

- Encroachment & anthropogenic pressure on WL habitat.
- WL poaching
- Forest fires in few pockets
- Degradation due to mining
- Unplanned solar fencing
- Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures
- Mining in elephant habitat
- Frequent public agitation
- Higher numbers of Solitary tuskers in the division
- Elephant conflict in Cashew field, Mango orchard

Deogarh Forest Division

STRENGTH

- Good quality forested habitat
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Established mechanism of Inter state coordination for elephant monitoring
- Good Coordination among Tata Power, Railways & Forest Dept.
- Part of Saranda-Keonjhar-Sundergarh-Bamra-Rourkela landscape
- Presence of leopard and prey in good density documented through CTI

WEAKNESS

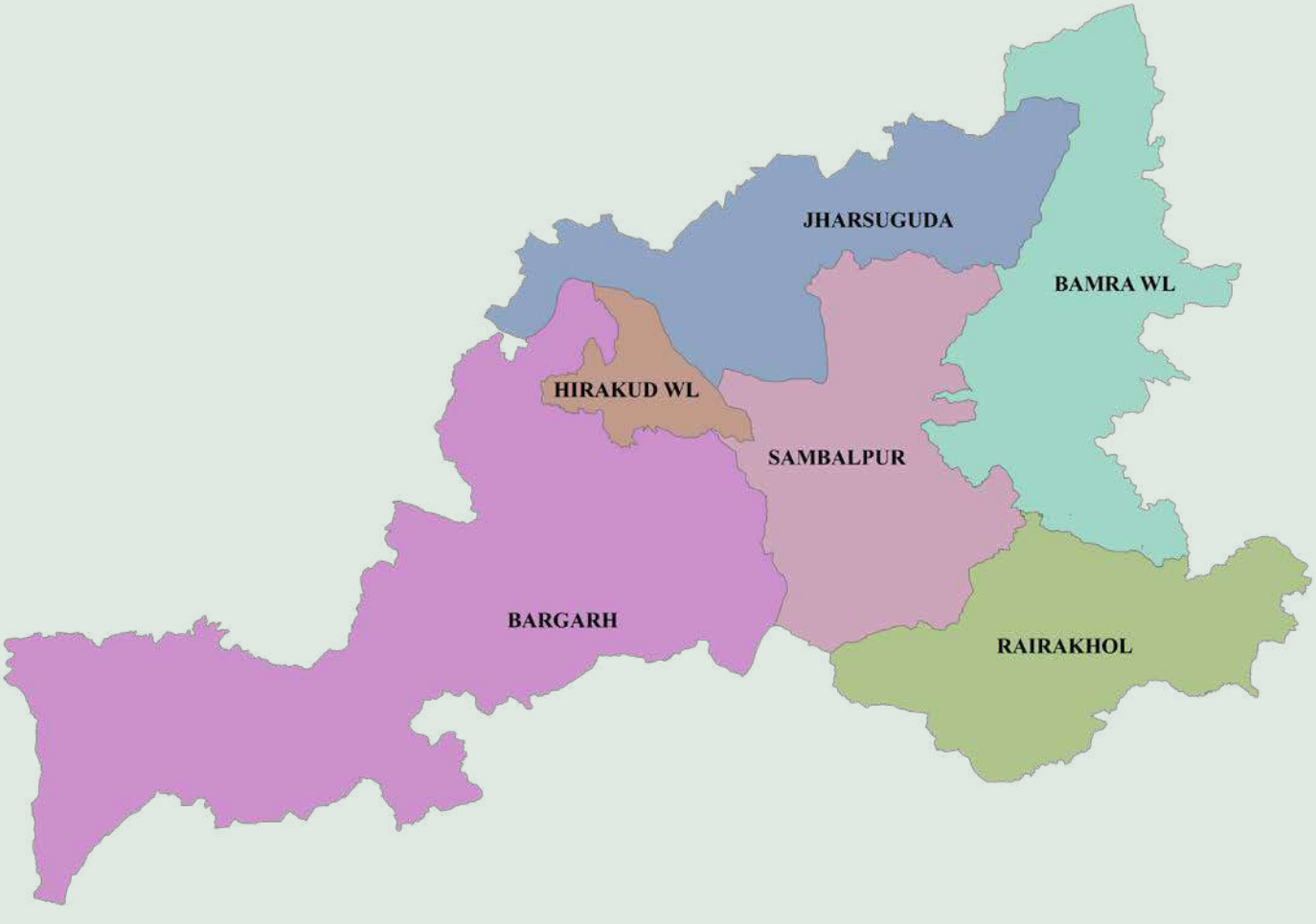
- Habitat degradation due to urbanization, irrigation canal, industry, shifting cultivation, mining & change in land use
- Increase in human death & injury due to elephant & sloth bear conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities & transit of WL articles
- Scarcity of water in WL habitat during summer

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Scientific planning of solar fencing
- Capacity building of Squad & Field staff
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC

THREAT

- Encroachment & anthropogenic pressure on WL habitat.
- WL poaching
- Forest fires in few pockets
- Degradation due to mining
- Unplanned solar fencing
- Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures
- Mining in elephant habitat
- Frequent public agitation
- Higher numbers of Solitary tuskers in the division
- Elephant conflict in Cashew field, Mango orchard & Palm plantations



SAMBALPUR CIRCLE

Sambalpur Forest Division

STRENGTH

- Part of Sambalpur ER, Hirakud IBA
- Good quality forested habitat
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Established mechanism of Inter state coordination for elephant monitoring
- Good Coordination among Tata Power, Railways & Forest Dept.
- Presence of leopard and prey other prey documented through CT
- RRT and MVU team at division level

WEAKNESS

- Habitat degradation due to urbanization, irrigation canal, industry & change in land use
- Increase in human death & injury due to elephant & sloth bear conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities & transit of WL articles
- Scarcity of water in WL habitat during summer

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Capacity building of RRT team, MVU, Squad & Field staff
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC

THREAT

- Encroachment & anthropogenic pressure on WL habitat.
- WL poaching
- Forest fires in few pockets
- Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures

Jharsuguda Forest Division

STRENGTH	WEAKNESS
▪ Patchy forested habitat ▪ Intensive elephant monitoring ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Established mechanism of Inter state coordination for elephant monitoring ▪ Good Coordination among Tata ▪ Power, Railways & Forest Dept.	▪ Habitat degradation due to urbanization, irrigation canal, industry, mining & change in land use ▪ Linear infrastructures fragmenting the WL habitat ▪ Increase in Crop damage due to Elephant and Wild pig ▪ Large scale vacancy in FG level ▪ Higher numbers of Forest fire incidences in few pockets. ▪ Inter-state WL poaching activities & transit of WL articles ▪ Scarcity of water in WL habitat during summer

OPPORTUNITY	THREAT
▪ Streamlining of Anukampa application processing ▪ AI/ML based WL surveillance ▪ Habitat improvement ▪ Retrofitting of linear infrastructures ▪ Implementation of SSWLCP ▪ prescriptions in mining areas ▪ Strengthening of electrical infrastructure ▪ Capacity building of Squad & Field staff ▪ Extensive community engagement and capacity building training for ecotourism, protection and management of HWC	▪ Encroachment & anthropogenic pressure on WL habitat. ▪ WL poaching ▪ Forest fires in few pockets ▪ Degradation due to mining ▪ Illegal hooking & faulty distribution ▪ network of Tata Power ▪ Railway, NH & other road infrastructures ▪ Mining in elephant habitat

Bamra Wildlife Division

STRENGTH

- Good quality forested habitat
- Badrama & Khalasuni WLS
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Established mechanism of Inter state coordination for elephant monitoring
- Good Coordination among Tata Power, Railways & Forest Dept.
- Part of Bamra-Rairakhol-Sambalpur landscape
- Presence of leopard and prey in good density documented through CT

WEAKNESS

- Lack of adequate protection infrastructure & inadequate patrol inside PA
- Habitat degradation due to urbanization, irrigation canal, industry, & change in land use
- Less meadow in PAs
- Increase in human death & injury due to elephant & sloth bear conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Inter-state WL poaching activities & transit of WL articles
- Scarcity of water in WL habitat during summer
- Division HQ location

OPPORTUNITY

- Upgradation of Camp infrastructure and road network
- Availability of mobile data network in camps
- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Capacity building of Squad & Field staff
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC

THREAT

- Encroachment & anthropogenic pressure on WL habitat.
- WL poaching
- Forest fires in few pockets
- Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures
- Higher numbers of Solitary tuskers in the division
- Rise in Elephant conflicts in winter season
- Unvaccinated livestock inside PA

Rairakhol Forest Division

STRENGTH

- Good quality forested habitat
- Adjascent to Badrama & Khalasuni WLS
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Good Coordination among Tata Power, Railways & Forest Dept.
- Part of Bamra-Rairakhol-Sambalpur landscape
- Presence of leopard and prey in good density documented through CT

WEAKNESS

- Habitat degradation due to urbanization & change in land use
- Increase in human death & injury due to elephant & sloth bear conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to
- Elephant and Wild pig
- Large scale vacancy in FG level
- Higher numbers of Forest fire incidences in few pockets.
- Scarcity of water in WL habitat during summer
- Unvaccinated livestock around Badrama-Khalasuni

OPPORTUNITY

- Upgradation of Camp infrastructure and road network
- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Capacity building of Squad & Field staff
- Extensive community engagement in protection and management of HWC

THREAT

- Encroachment & anthropogenic pressure on WL habitat.
- WL poaching
- Forest fires in few pockets
- Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road
- infrastructures
- Rise in Elephant conflicts in winter season

Bargarh Forest Division

STRENGTH

- Part of CG-Odisha Interstate WL corridor
- Good quality forested habitat
- Contiguous with Debrigarh WLS & Nrusinghnath area
- Intensive elephant monitoring
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Established mechanism of Inter state
- coordination for elephant monitoring
- Good Coordination among Tata Power, Railways & Forest Dept.
- Presence of tiger, leopard and prey other prey documented through CT
- RRT and MVU team at division level

WEAKNESS

- Habitat degradation due to urbanization, irrigation canal, industry & change in land use
- Increase in human death & injury due to elephant & sloth bear conflicts
- Linear infrastructures fragmenting the WL habitat
- Increase in Crop damage due to Elephant and Wild pig
- Large scale vacancy in FG level
- Inter-state WL poaching activities & transit of WL articles
- Scarcity of water in WL habitat during summer

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance
- Habitat improvement
- Retrofitting of linear infrastructures
- Implementation of SSWLCP prescriptions in mining areas
- Strengthening of electrical infrastructure
- Capacity building of RRT team, MVU,
- Squad & Field staff
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC
- Intensive monitoring of interstate WL migration
- Pangolin & sloth bear conservation

THREAT

- Encroachment & anthropogenic pressure on WL habitat.
- WL poaching
- Illegal hooking & faulty distribution network of Tata Power
- Railway, NH & other road infrastructures
- Lack of public support

Hirakud Wildlife Division

STRENGTH

- Debrigarh WLS & Hirakud reservoir Ramsar Site
- Having good numbers of gaur, leopards & prey base
- Evidence of presence of tigers in recent years
- Well maintained meadow, infrastructure, road, VHF & protection infrastructure
- Successful community based ecotourism model
- Well trained staff
- Good quality forested habitat
- Intensive WL monitoring
- Proactive community engagement in fire protection, forest & WL conservation
- Free from anthropogenic disturbances
- Less HWC & Wildlife Crime
- Connected to CG forest via Bargarh

WEAKNESS

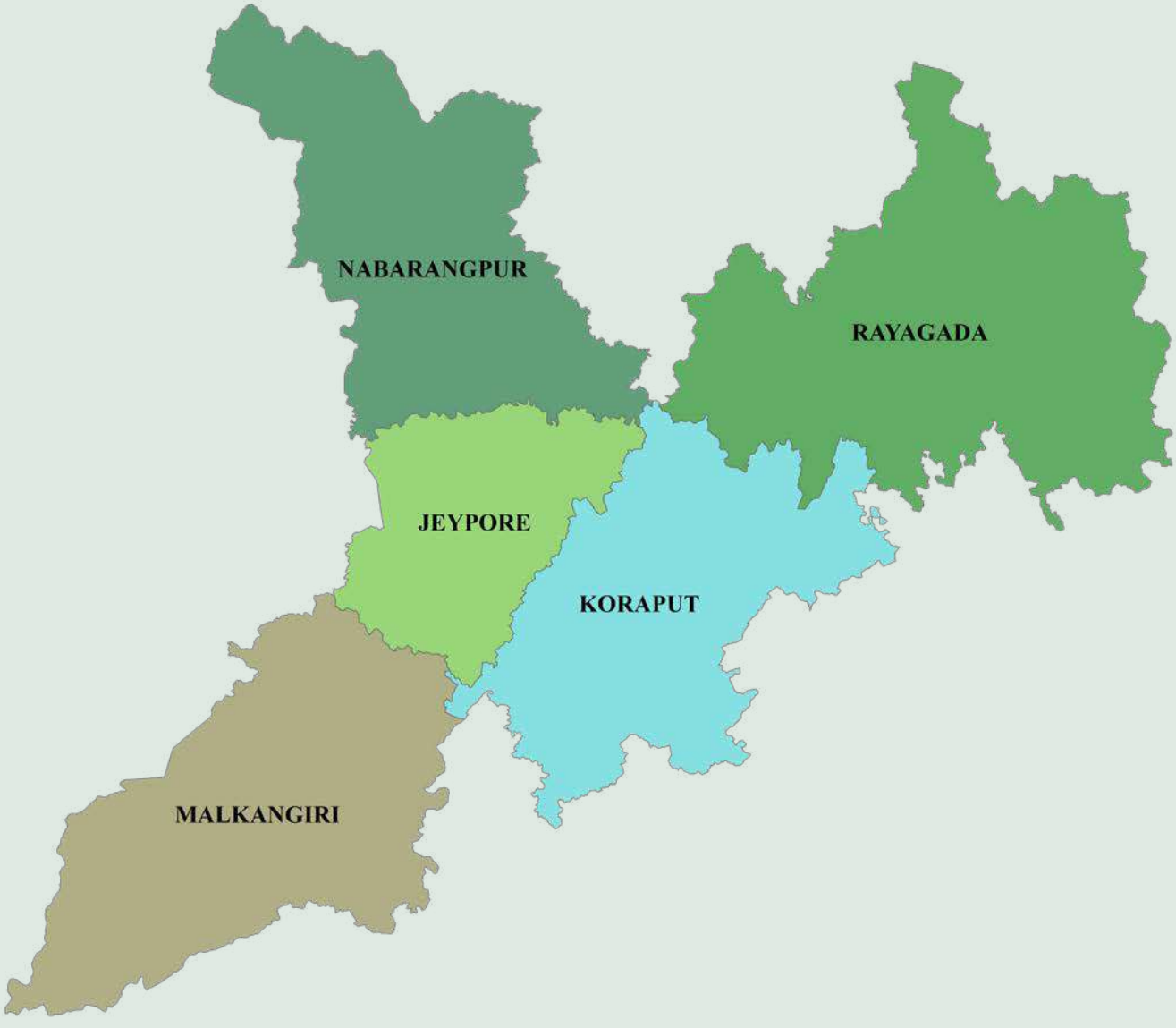
- Large scale vacancy in field level
- Lack of mobile network
- No incentives for staff working in isolated interior camps
- CG-Odisha WL corridor protection status
- Small area under PA status

OPPORTUNITY

- AI/ML based WL surveillance
- Habitat improvement
- Ring vaccination against important livestock diseases
- Monitoring of WL dispersal from CG
- Extensive community engagement and capacity building training for ecotourism, protection and management of HWC
- Improvement of Sambalpur Zoo
- Reorganisation of Hirakud Wildlife Division

THREAT

- Forest fires in isolated patches
- WL poaching in fringe areas
- Safety of dispersing tigers in the fringe areas



KORAPUT CIRCLE

Koraput Forest Division

STRENGTH	WEAKNESS
▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to Sloth bears only ▪ Community based ecotourism	▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ Forest Fire ▪ Shifting cultivation ▪ Traditional hunting festivals by tribals ▪ Mining in forest areas ▪ Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY	THREAT
▪ Management of Sloth bear conflicts ▪ Functional RRT team ▪ Jeypore Ground Gecko conservation ▪ Indian Star Tortoise & other species specific conservation measures ▪ Pangolin & big cat conservation initiative ▪ Capacity building of Squad & Field staff	▪ LWE activity in few pockets ▪ Sloth bear conflicts resulting in multiple human mortality

Jeypore Forest Division

STRENGTH	WEAKNESS
▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to Sloth bears only	▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ Forest Fire ▪ Shifting cultivation ▪ Traditional hunting festivals by tribals ▪ Mining in forest areas ▪ Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY	THREAT
▪ Management of Sloth bear conflicts ▪ Functional RRT team ▪ Jeypore Ground Gecko conservation ▪ Pangolin & big cat conservation initiative ▪ Indian Star Tortoise & other species specific conservation measures ▪ Mugger conservation initiative ▪ Capacity building of Squad & Field staff	▪ LWE activity in few pockets ▪ Sloth bear conflicts resulting in multiple human mortality

Malkangiri Forest Division

STRENGTH	WEAKNESS
▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to Sloth bears only ▪ Community based ecotourism ▪ Functional RRT	▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ Extensive impact of Forest Fire ▪ Shifting cultivation ▪ Traditional hunting festivals by tribals ▪ Mining in forest areas ▪ Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY	THREAT
▪ Management of Sloth bear conflicts ▪ Functional RRT team ▪ Jeypore Ground Gecko conservation ▪ Indian Star Tortoise & other species specific conservation measures ▪ Pangolin & big cat conservation initiative ▪ Mugger conservation initiative ▪ Capacity building of RRT, Squad & Field staff	▪ LWE activity in few pockets ▪ Sloth bear conflicts resulting in multiple human mortality ▪ Ganja cultivation in forest areas

Nabarangpur Forest Division

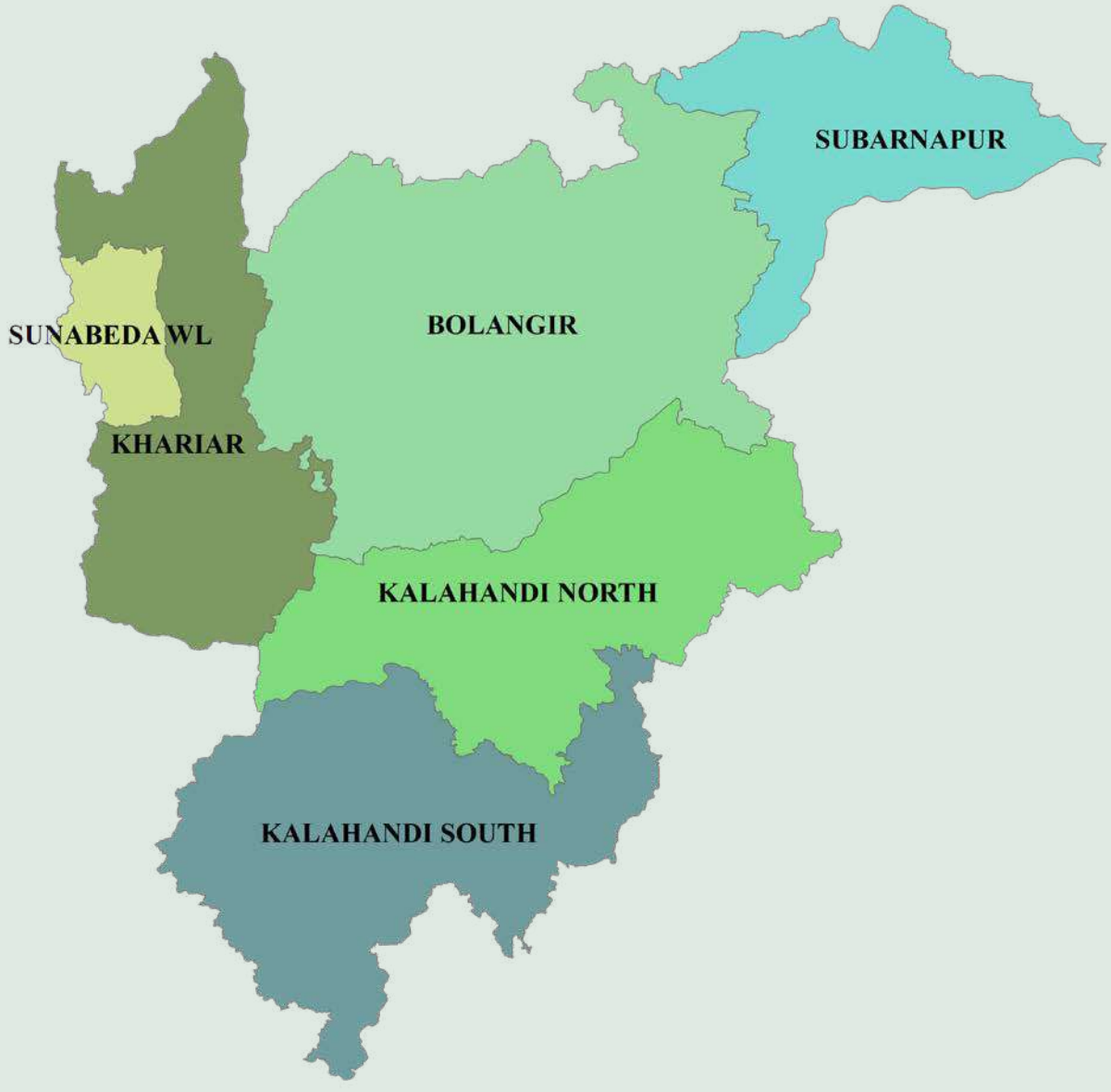
STRENGTH	WEAKNESS
▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to Sloth bears only & on rare cases due to migratory elephants ▪ Functional RRT ▪ Deer Park ▪ Inter-state WL corridor	▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ Extensive impact of Forest Fire ▪ Shifting agriculture ▪ Extensive Maize cultivation ▪ Traditional hunting festivals by tribals ▪ Mining in forest areas ▪ Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY	THREAT
▪ Management of Sloth bear conflicts ▪ Pangolin & big cat conservation initiative ▪ Capacity building of RRT, Squad & Field staff	▪ Forest encroachment ▪ LWE activity in few pockets ▪ Sloth bear conflicts resulting in multiple human mortality ▪ Maize cultivation in forest areas ▪ Ganja cultivation in few forest areas ▪ Seasonal movement of elephants in few Ranges

Rayagada Forest Division

STRENGTH	WEAKNESS
▪ Presence of elephant in few ranges. ▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to elephant & Sloth bears only ▪ Large forest area in the division ▪ Interstate WL corridor ▪ Functional RRT team	▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ Extensive impact of Forest Fire ▪ Shifting cultivation ▪ Traditional hunting festivals by tribals ▪ Mining in forest areas ▪ Inter-state WL poaching activities & transit of WL articles

OPPORTUNITY	THREAT
▪ Effective Management of seasonal migration of elephants & Sloth bear conflicts ▪ Jeypore Ground Gecko conservation ▪ Indian Star Tortoise & other species specific conservation measures ▪ Pangolin & big cat conservation initiative ▪ Capacity building of Squad & Field staff	▪ LWE activity in few pockets ▪ Sloth bear conflicts resulting in ▪ multiple human mortality ▪ Seasonal movement of elephants in few Ranges ▪ Ganja cultivation in forest areas



BHAWANIPATNA CIRCLE

Bolangir Forest Division

STRENGTH

- Presence of elephant, leopard in few ranges.
- Less no of Human Wildlife Conflicts cases
- Majority of HWC cases are related to elephant & Sloth bears only
- Large forest area in the division
- Interstate WL corridor
- Species richness
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Well trained RRT
- Good Coordination among Tata Power, Railways & Forest Dept.

WEAKNESS

- Degraded forest & fragmented habitat
- Anthropogenic pressure on WL habitat
- Extensive impact of Forest Fire
- Crop damage due to monkey issue
- Traditional hunting festivals by tribals
- Inter-state WL poaching activities & transit of WL articles
- Scarcity of water in WL habitat

OPPORTUNITY

- Effective Management of seasonal migration of elephants & Sloth bear conflicts
- Pangolin & big cat conservation initiative
- Capacity building of RRT, Squad & Field staff
- Intensive monitoring of WL
- Streamlining of Anukampa application processing

THREAT

- LWE activity in few pockets
- Elephant & Sloth bear conflicts resulting in multiple human mortality
- Seasonal movement of elephants in few Ranges
- Unsustainable NTFP harvesting
- Protection of dispersing big cats in the landscape
- Illegal hooking & faulty distribution network of Tata Power

Subarnapur Forest Division

STRENGTH	WEAKNESS
▪ Presence of elephant, leopard in few ranges. ▪ Less no of Human Wildlife Conflicts cases ▪ Interstate WL corridor ▪ Proactive community engagement in fire protection, forest & WL conservation ▪ Good Coordination among Tata Power & Forest Dept.	▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ Impact of Forest Fire ▪ Inter-state WL poaching activities & transit of WL articles ▪ Scarcity of water in WL habitat

OPPORTUNITY	THREAT
▪ Effective Management of seasonal migration of elephants & Sloth bear conflicts ▪ Pangolin & big cat conservation initiative ▪ Capacity building of Squad & Field staff ▪ Intensive monitoring of WL	▪ Elephant & Sloth bear conflicts resulting in multiple human mortality ▪ Seasonal movement of elephants in few Ranges ▪ Unsustainable NTFP harvesting ▪ Illegal hooking & faulty distribution network of Tata Power

Khariar Forest Division

STRENGTH	WEAKNESS
▪ Part of Sunabeda-Sitanadi-Udanti WL landscape ▪ Presence of big cats & prey species ▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to Sloth bears & leopards only ▪ Large forest area in the division ▪ Interstate WL corridor ▪ Species richness ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Well trained RRT	▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ Extensive impact of Forest Fire ▪ Traditional hunting festivals by tribals ▪ Inter-state WL poaching activities & transit of WL articles ▪ Scarcity of water in WL habitat ▪ Lack of adequate patrolling infrastructure & communication network

OPPORTUNITY	THREAT
▪ Management of dispersing and resident big cats ▪ Effective Management of seasonal migration of elephants, Sloth bear & big cat conflicts ▪ Pangolin & big cat conservation initiative ▪ Capacity building of RRT, Squad & Field staff ▪ Intensive monitoring of WL ▪ Feasibility of Wild buffalo reintroduction	▪ LWE activity in pockets ▪ Elephant, Sloth bear conflicts resulting in multiple human mortality ▪ Seasonal movement of elephants in few Ranges ▪ Unsustainable NTFP harvesting ▪ Protection of dispersing big cats in the landscape

Sunabeda Wildlife Division

STRENGTH

- Part of Sunabeda-Sitanadi-Udanti WL landscape
- Presence of big cats & prey species
- Less no of Human Wildlife Conflicts cases
- Majority of HWC cases are related to Sloth bears & leopards only
- Good quality forest
- Interstate WL corridor
- Species richness

WEAKNESS

- Anthropogenic pressure on WL habitat
- Encroachment & fragmentation
- Grazing pressure
- Extensive impact of Forest Fire
- Traditional hunting festivals by tribals
- Inter-state WL poaching activities & transit of WL articles
- Scarcity of water in WL habitat
- Lack of adequate patrolling infrastructure & communication network

OPPORTUNITY

- Management of dispersing and resident big cats
- Effective Management of seasonal migration of big cat conflicts
- Pangolin & big cat conservation initiative
- Capacity building of Squad & Field staff
- Intensive monitoring of WL
- Feasibility of Wild buffalo reintroduction
- Formation of RRT
- Mobilization of community for WL conservation
- Interstate coordination for WL protection & enforcement

THREAT

- LWE activity in pockets
- Sloth bear conflicts resulting in multiple human mortality
- Unsustainable NTFP harvesting
- Protection of dispersing big cats in the landscape
- Anthropogenic pressure
- Encroachment

Kalahandi North Forest Division

STRENGTH

- Presence of elephant, leopard in few ranges.
- Less no of Human Wildlife Conflicts cases
- Majority of HWC cases are related to elephant & Sloth bears only
- Large forest area in the division
- Interstate WL corridor
- Species richness
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Well trained RRT
- Good Coordination among Tata Power, Railways & Forest Dept.

WEAKNESS

- Degraded forest & fragmented habitat
- Anthropogenic pressure on WL habitat
- Extensive impact of Forest Fire
- Traditional hunting festivals by tribals
- Inter-state WL poaching activities & transit of WL articles
- Scarcity of water in WL habitat
- Linear infrastructure
- Increase in human death & injury due to elephant & sloth bear conflicts
- Degradation of Kotagarh-Karlapat corridor via Urladani & Taprang

OPPORTUNITY

- Effective Management of seasonal migration of elephants & Sloth bear conflicts
- Pangolin & big cat conservation initiative
- Capacity building of RRT, Squad & Field staff
- Intensive monitoring of WL
- Streamlining of Anukampa application processing
- Habitat improvement & Karlapat PA extension
- Retrofitting of linear infrastructures
- Strengthening of electrical infrastructure
- Mechanism of Inter state coordination for WL protection

THREAT

- LWE activity in few pockets
- Elephant & Sloth bear conflicts resulting in multiple human mortality
- Seasonal movement of elephants in few Ranges
- Unsustainable NTFP harvesting
- Protection of dispersing big cats in the landscape
- Illegal hooking & faulty distribution network of Tata Power

Kalahandi South Forest Division

STRENGTH	WEAKNESS
▪ Karlapat WLS ▪ Presence of elephant, leopard in few ranges. ▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to elephant & Sloth bears only ▪ Large forest area in the division ▪ Interstate WL corridor ▪ Species richness ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Well trained RRT @ Bhawanipatna ▪ Good Coordination among Tata Power, Railways & Forest Dept.	▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ Extensive impact of Forest Fire ▪ Traditional hunting festivals by tribals ▪ Inter-state WL poaching activities & transit of WL articles ▪ Scarcity of water in WL habitat ▪ Linear infrastructure ▪ Increase in human death & injury due to elephant & sloth bear conflicts ▪ Degradation of Kotagarh-Karlapat – Lakhari Valley corridor ▪ Encroachment

OPPORTUNITY	THREAT
▪ Effective Management of seasonal migration of elephants & Sloth bear conflicts ▪ Pangolin & big cat conservation initiative ▪ Capacity building of RRT, Squad & Field staff ▪ Intensive monitoring of WL ▪ Streamlining of Anukampa application processing ▪ Habitat improvement ▪ Retrofitting of linear infrastructures ▪ Strengthening of electrical infrastructure ▪ mechanism of Inter state coordination for WL protection	▪ LWE activity in few pockets ▪ Elephant & Sloth bear conflicts resulting in multiple human mortality ▪ Seasonal movement of elephants in few Ranges ▪ Unsustainable NTFP harvesting ▪ Protection of dispersing big cats in the landscape ▪ Illegal hooking & faulty distribution network of Tata Power

BERHAMPUR CIRCLE

Baliguda Forest Division

STRENGTH	WEAKNESS
▪ Kotagarh WLS ▪ Presence of elephant, leopard in few ranges. ▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to elephant & Sloth bears only ▪ Large forest area in the division ▪ Connected to other PAs ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Good Coordination among Tata Power, Railways & Forest Dept. ▪ Ecotourism	▪ Extensive impact of Forest Fire ▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ Podu cultivation ▪ Traditional hunting festivals by tribals ▪ WL poaching activities & transit of WL articles ▪ Linear infrastructure ▪ Human death & injury due to elephant & sloth bear conflicts ▪ Degradation of Kotagarh-Karlapat – ▪ Lakhari Valley corridor ▪ Encroachment

OPPORTUNITY	THREAT
▪ Forest Fire management ▪ Effective Management of seasonal migration of elephants & Sloth bear conflicts ▪ Pangolin & big cat conservation initiative ▪ Capacity building of Squad & Field staff ▪ Intensive monitoring of WL ▪ Streamlining of Anukampa application processing ▪ WLS Habitat improvement ▪ Strengthening of electrical infrastructure ▪ mechanism of Inter division coordination for WL protection	▪ Extensive fire, encroachment & podu cultivation ▪ LWE activity in few pockets ▪ Elephant & Sloth bear conflicts resulting in multiple human mortality ▪ Seasonal movement of elephants in few Ranges ▪ Unsustainable NTFP harvesting ▪ Protection of dispersing big cats in the landscape ▪ Illegal hooking & faulty distribution network of Tata Power

Phulbani Forest Division

STRENGTH

- Presence of elephant, leopard in few ranges.
- Less no of Human Wildlife Conflicts cases
- Majority of HWC cases are related to elephant & Sloth bears only
- Large forest area in the division
- Connected to other forest landscape
- Proactive NGOs & community engagement in fire protection, forest & WL conservation
- Good Coordination among Tata Power, Railways & Forest Dept.

WEAKNESS

- Extensive impact of Forest Fire
- Degraded forest & fragmented habitat
- Anthropogenic pressure on WL habitat
- Traditional hunting festivals by tribals
- WL poaching activities & transit of WL articles
- human death & injury due to elephant & sloth bear conflicts
- Encroachment

OPPORTUNITY

- Forest Fire management
- Effective Management of seasonal migration of elephants & Sloth bear conflicts
- Pangolin & big cat conservation initiative
- Capacity building of Squad & Field staff
- Intensive monitoring of WL
- WLS Habitat improvement
- Strengthening of electrical infrastructure
- mechanism of Inter division coordination for WL protection

THREAT

- Extensive fire incidences
- LWE activity in few pockets
- Elephant & Sloth bear conflicts resulting in multiple human mortality
- Seasonal movement of elephants in few Ranges
- Unsustainable NTFP harvesting
- Protection of dispersing big cats in the landscape
- Illegal hooking & faulty distribution network of Tata Power

Boudh Forest Division

STRENGTH	WEAKNESS
▪ Part of Satkosia TR & Mahanadi ER landscape ▪ Gharial, Mugger & riverine habitat ▪ Presence of elephant, leopard in few ranges. ▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to elephant ▪ Large forest area in the division ▪ Connected to other PAs ▪ Proactive NGOs & community engagement in fire protection, forest & WL conservation ▪ Good Coordination among Tata Power, Railways & Forest Dept.	▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ WL poaching activities & transit of WL articles ▪ Linear infrastructure ▪ human death & injury due to elephant ▪ Protection infrastructure & communication network

OPPORTUNITY	THREAT
▪ Forest Fire management ▪ Effective Management of seasonal migration of elephants ▪ Gharial, Mugger, Pangolin & big cat conservation initiative ▪ Capacity building of Squad & Field staff ▪ Intensive monitoring of WL ▪ Habitat improvement ▪ Strengthening of electrical infrastructure ▪ Mechanism of Inter division coordination for WL protection	▪ Extensive fire, encroachment ▪ LWE activity in few pockets ▪ Elephant & Sloth bear conflicts resulting in multiple human mortality ▪ Seasonal movement of elephants in few Ranges ▪ Unsustainable NTFP harvesting ▪ Protection of dispersing big cats in the landscape ▪ Illegal hooking & faulty distribution network of Tata Power

Paralakhemundi Forest Division

STRENGTH	WEAKNESS
▪ Lakhari Valley WLS ▪ Mahendragiri BHS ▪ Presence of tiger, leopard, elephant & other prey species ▪ Less no of Human Wildlife Conflicts cases ▪ Species richness in habitat ▪ Majority of HWC cases are related to elephant & Sloth bears only ▪ Large forest area in the division ▪ Interstate WL corridor ▪ Functional RRT team ▪ Lakhari valley-Karlapat-Kotagarh WL corridor ▪ Red sanders habitat	▪ Degraded forest & fragmented habitat ▪ Soil erosion & Shifting cultivation ▪ Anthropogenic pressure on WL habitat ▪ Extensive impact of Forest Fire ▪ Shifting cultivation ▪ Traditional hunting festivals by tribals ▪ Inter-state WL poaching activities & transit of WL articles ▪ Human-sloth bear conflicts ▪ Inadequate Protection infra and communication network in PA ▪ Water scarcity in WL habitat

OPPORTUNITY	THREAT
▪ Protection of interstate dispersing big cats ▪ Effective Management of seasonal migration of elephants & Sloth bear conflicts ▪ Pangolin & big cat conservation initiative ▪ Holistic improvement of Mahendragiri BHS ▪ Prey augmentation in PA ▪ Intensive monitoring of WL ▪ Capacity building of RRT, Squad & Field staff ▪ Orchid conservation	▪ LWE activity in few pockets ▪ Sloth bear conflicts resulting in multiple human mortality ▪ Seasonal movement of elephants in few Ranges ▪ Ganja cultivation in few forest areas ▪ Extensive cashew plantation in forest areas

Berhampur Forest Division

STRENGTH

- Olive Ridley mass nesting site near Rushikulya
- Tampara Ramsar Site
- Ghodahada Mugger Habitat
- Blackbuck population
- Good quality forested habitat
- Intensive elephant monitoring
- Good Coordination among Tata Power, Railways & Forest Dept.
- Proactive NGOs & community engagement in fire protection, forest & WL conservation

WEAKNESS

- Habitat degradation due to anthropogenic pressure, infra development & change in land use
- Increase in human death & injury due to WL conflicts related to elephant, sloth bear & mugger
- Linear infrastructures fragmenting
- the WL habitat
- Increase in Crop damage due to Elephant, Blackbuck and Wild pig
- Large scale vacancy in FG level
- Climate change impact on nesting beach
- Inadequate Marine Protection Squad, equipment & speed boats

OPPORTUNITY

- Streamlining of Anukampa application processing
- AI/ML based WL surveillance for WL
- Habitat improvement
- Retrofitting of linear infrastructures
- Strengthening of electrical infrastructure
- Tampara wetland conservation
- Conservation, protection & tourist management of Olive Ridley nesting beach
- Blackbuck habitat management
- Forest fire management
- Mugger, Pangolin& freshwater turtle conservation & management
- Capacity building of RRT, Squad & Field staff

THREAT

- Illegal hooking & faulty distribution network of Tata power
- Railway, NH & other road infrastructures
- Fragmentation of elephant migration route
- Elephant conflict in Cashew field , Mango orchard & during winter season
- Poaching of WL
- Protection & management of Mass nesting beach
- Blackbuck conservation in non- forest area
- Forest Fire in few pockets
- Inter-state WL poaching activities & transit of WL articles

Ghumsur North Forest Division

STRENGTH	WEAKNESS
▪ Presence of elephant, leopard, blackbuck & other prey species . ▪ Less no of Human Wildlife Conflicts cases ▪ Majority of HWC cases are related to elephant, monkey & Sloth bears only ▪ Large forest area in the division ▪ Connected to other WL habitat ▪ Community engagement in fire protection, forest & WL conservation ▪ Good Coordination among Tata Power, Railways & Forest Dept. ▪ Ecotourism ▪ One of the oldest divisions ▪ Functional RRT	▪ Impact of Forest Fire ▪ Degraded forest & fragmented habitat ▪ Anthropogenic pressure on WL habitat ▪ WL poaching activities & transit of WL articles ▪ Human death & injury due to elephant & sloth bear conflicts ▪ Encroachment ▪ Grazing pressure

OPPORTUNITY	THREAT
▪ Forest Fire management ▪ Effective Management of elephants, blackbuck & Sloth bear conflicts ▪ Big cat conservation initiative ▪ Capacity building of RRT, Squad & Field staff ▪ Intensive monitoring of WL ▪ Streamlining of Anukampa application processing ▪ Population Management of Blackbuck and habitat management ▪ Strengthening of electrical infrastructure ▪ Mechanism of Inter division coordination for WL & Forest protection	▪ Fire & encroachment ▪ Elephant & Sloth bear conflicts resulting in multiple human mortality ▪ Seasonal movement of elephants in few Ranges ▪ Unsustainable NTFP harvesting ▪ Protection of dispersing big cats in the landscape ▪ Illegal hooking & faulty distribution network of Tata Power

Ghumsur South Forest Division

STRENGTH

- Blackbuck population
- Presence of elephant, leopard, blackbuck & other prey species
- Less no of Human Wildlife Conflicts cases
- Majority of HWC cases are related to elephant, blackbuck monkey & Sloth bears only
- Connected to other WL habitat
- community engagement in fire protection, forest & WL conservation
- Good Coordination among Tata Power, Railways & Forest Dept.
- Ecotourism
- One of the oldest divisions

WEAKNESS

- Increasing population of Blackbuck & issues related to their dispersal & crop damage
- Impact of Forest Fire
- Degraded forest & fragmented habitat
- Anthropogenic pressure on WL habitat
- WL poaching activities & transit of WL articles
- human death & injury due to elephant & sloth bear conflicts
- Encroachment
- Grazing pressure

OPPORTUNITY

- Forest Fire management
- Effective Management of elephants, blackbuck & Sloth bear conflicts
- Big cat conservation initiative
- Capacity building of Squad & Field staff
- Intensive monitoring of WL
- Streamlining of Anukampa application processing
- Blackbuck Habitat improvement
- Strengthening of electrical infrastructure
- Mechanism of Inter division coordination for WL & Forest protection

THREAT

- Fire & encroachment
- Elephant & Sloth bear conflicts resulting in increasing HWC
- Seasonal movement of elephants in few Ranges
- Unsustainable NTFP harvesting
- Illegal hooking & faulty distribution network of Tata Power

2.2 Gap analysis of wildlife conservation in PA and territorial forests in Odisha

Gap analysis was done to identify specific concerns related to key species, ecological conditions and management regimes which are important to realize the vision of wildlife conservation in the state i.e. "to create a proper space for wildlife in the overall scheme of things within the civil society and governance of the State - a space that would be suffused by our traditional values of care, concern and compassion for wildlife". Gap analysis for wildlife conservation in protected areas and territorial forests of Odisha have been carried out and identified in following three categories.

a. Species Specific Conservation Strategy Gaps: This plan has been designed to cater to the need of focused conservation strategy and funding for such less discussed and known species which are either illegally traded, hunted or are suffering the threat of extinction due to loss of habitat. Some of such species are horseshoe crab, elongated turtle (Indotestudo elongata), mangrove pitta, several riverain and coastal birds', specifies associated with the mangrove habitat and all endemic floral and faunal species which special emphasis on orchids and herpeto fauna.

b. Habitat Degradation and Connectivity Gaps: Due to the increased developmental activities including mining, industrialization, agricultural expansion, urbanization, infrastructure modernization etc. wildlife and their habitats including their biological resources and ecological processes have been exposed to ever increasing biotic and anthropogenic pressures. The most prominent cause of concern due to these activities is fragmentation of wildlife habitat and degradation of its quality. The edge species and those who resides in ecotonal areas are the worse suffers. It is a possibility that many of the lesser- known species are fast disappearing without our knowledge. Specific attention is required to minimize and mitigate the adverse impacts of such activities with special emphasis on linear infrastructure that pose the gravest danger by crisscrossing and thus segregating the inviolate areas of wilderness. This plan seeks to address the aforesaid gap and to create more inviolate areas that would act as repository of the state biodiversity.

c. Administrative Gaps: The plan while being formulated has identified either a lack of management strategies that are designed for holistic conservation of certain wildlife species, their habitat or both or the said plans have not been executed properly for an adequate tenure supplemented by suitable follow up processes. Reintroduction of hardground Barasingha in Western Odisha, supplementation Programmes of Tigers, population control of Black Bucks in Ghumsur area, reintroduction of Black Bucks in Puri-Konark Wildlife Sanctuary and Gaurs in Chandaka-Damapada Wildlife Sanctuary, Conservation Programmes of Indian skimmers and Gharials are some of the many issues flagged here.

d. Research Study Gaps: The wildlife organization have been devoid of its inhouse scientific manpower since 2016 after superannuation of all 3 senior scientific officers. This has had a serious impact on furthering long term scientific studies that are key to evolve management strategies as required by the concurrent time to ensure wildlife conservation. The wildlife organization has largely been

dependent on studies conducted by outside research organization and institutions. For the very purpose enrolling dedicated domain experts on

e. outsource basis and to formulate standalone rule for inducting wildlife scientific officers into the cadre has never been more imperative and the plan aptly caters to this specific and strategic requirement.

f. Capacity building gaps: Specific activities like handling crisis situation, rescue and release operations, human wildlife conflict scenario, clandestine activity detection and following the due legal path, checking on illicit trade of contraband items, achieving greater rate of conviction in wildlife offence cases, common digital wildlife crime data base creation, maintenance and analysis skills, forensic capabilities, wildlife therapeutics, use of modern technology for wildlife surveillance, monitoring and conservation activities are a few specialized skills, where there is need to develop skilled man power in house, within the department is of urgent need to further perseverance initiatives of the wildlife biodiversity in the state.

g. Awareness, sensitization and Extension gaps: The department needs to develop specific programs to educate the citizens, opinion builders, media, people from the civil societies, grassroot level stakeholders, students, PRI members, bureaucrats and officers of the line department so as to avoid any kind of confusion or non-co-operation, that is very often faced by the department. This would accentuate better coordination and support to meet the desired objectives of the management initiatives.

2.3 Inference

The thorough analysis of Strength, Weakness, Opportunity & Threat associated with all the 51 divisions done at individual division level after going through thorough deliberations with various stakeholders followed by gap analysis forms the basis of the Regional Wildlife Management Plan (RWLMP) and accordingly year wise proposal having specific identified activities spanning across 10 years has been formulated.

Annual Plan of Operations 2024-25 to 2033-34

CHAPTER 3

3.1 Basis of Proposals

The suggestions made under Odisha State Comprehensive Wildlife Management Guidelines (OSCOW-MAG), the key points of the Comprehensive Action Plan and the Strength, Weakness, Opportunity & Threat (SWOT) analysis of all the 51 divisions followed by gap analysis formed the basis of proposal for this plan.

The broad-based proposals which form the basis of this plan stands on 19 broad based pillars. These pillars are along with detailed activities proposed, the 19 broad based pillars are depicted in the table below.

Table: 3.1.1 Broad based pillars along with proposed activities under the RWLMP

Sl. No.	Name of the Pillar	Recommended activities	
A	Wildlife Estimation and Census Exercise	• Elephant Census • All Odisha Tiger, Co-predators & Prey Estimation. • Crocodile Census	• Dolphin Census • Bird Census (including resident birds & heronry monitoring)
B	Monitoring of PAs & Wetlands	• Internal Management Effectiveness Evaluation (MEE) of Protected Areas.	• Preparation of Annual Health Card of Important Wetlands.
C	Species Specific Conservation Plan	• Olive Ridley Turtle • Salt Water Crocodile • Dolphin • Sloth Bear • Pangolin • Blackbuck • Indian Skimmer • Mangrove Pitta	• Fresh Water Turtle • Fishing Cat & other small Carnivores • Gaur • Prey Augmentation & reintroduction of Herbivores. • RET flora & other important flora in WL habitat.
D	Wildlife Habitat Management	• Creation of Meadow • Management of old Meadow • Invasive Weed Management • Management of Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement.	• Pond/ Waterbody Creation & Maintenance • Saltlick Creation & management • Unique & Special Habitat Mapping & Management • Forest Fire Management

E	Mangrove Habitat Management	• Perimeter Fencing for protection & management of Mangrove Forest • Fishbone Channel Digging	• Creek renovation • Heronry Management • Nature Trail & Patrolling Route Improvement
F	Active Wildlife Management	• Tiger & other large carnivore • Elephant • Gaur • Blackbuck • Sambar	• Spotted Deer • Salt Water Crocodile & etc. • Development & maintenance of mini zoos, deer parks etc.
G	Infrastructure Development	• Composite Unit • Protection barrack • Watch Tower • Electricity & Solar Power System	• Tube well & dug well provision • VHF new & repair, Control Room • VSAT / data and Mobile connection
H	Captive Elephant Management	• Elephant Transit House & other ancillary unit Construction & Maintenance • Kumki Elephant Feeding, Health Management & other operational cost	• Elephant Transportation • Kumki Elephant Training Program • Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit
I	Wildlife Conflict Management	• New Rapid Response Team formation, Vehicle & Equipment. • Upgradation of existing RRT • RRT operational cost • Engagement of Ex-military & other special squads for Similipal, Satkosia & other important WL habitat. • Solar Fencing (Permanent & Temporary) • Snake bite Management	• Logistics & operational cost of WL conflict management. • Barricading of Open Well in WL habitat • Use of modern technological solutions like IR based cameras, Thermal drones, night vision cameras, AI & ML based surveillance system & other innovative system

J	Wildlife Health Management	• WL / Zoo Hospital Construction and Maintenance • Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance.	• Tratment of Wildlife & other ancillary operational cost. • Procurement of Drugs, Medicine and Dart Guns.
K.	Institution & Academy	• State WL Forensic Cell establishment	• State WL Training Centre, Godibari upgradation & maintenance.
L	Community Based WL Conservation Program	• Elephant - Gajasathis	---
M	Equipment & Logistics	• Camera trap • Point & Shoot Cameras • Night Vision Camera • Drone	• Laser Range Finder • Weather Stations & data logger • Binoculars & Spotting Scope
N	IEC on WL Management	• Documentary Movie • Posters, Banners, Sign boards, etc. • Books, Journals, Compendium, etc. • Media campaigns	• Social media campaigns • Awareness campaigns in field through folk art, dance & other traditional way. • VSS/EDC/SHG sensitization
O	Nature Interpretation Exercise	• UNMADANA- centralized theme based children interpretation module development & nature interpretation exercise.	• Night Safari • WL theme based competition in School & College.

P	Training & Capacity Building	• State level training • Regional level training • Division level training • State level meeting & workshop • Inter-state coordination meeting & workshop • Snakebite Programme	• Exposure visit for forest officials to different Pas • MOU with reputed international and national institutes/ NGOs/ academies & agencies.
Q	Wildlife Crime Control	• JTFs constitution & operational cost	• Legal awareness and Assistance
R	Research & Development	• Need based research on WL conservation • Mobile and Web based application development & operational support.	• PMU establishment @ WL HQ • Establishment of Field level Research Centre
S	Staff Welfare Measures	• Flexi fund for Squad Wages • Personal gears & safety equipment • Logistics & equipment support to field establishments	• Incentivization for staff for use of latest technology & best practices • Awards & Honours for Officials & squads members

3.2 Financial Outlay

As per the priority set out on the basis of proposals, the following interventions are proposed in this Regional Wildlife Management Plan for each year for 10 subsequent years. The detailed outlay for each Annual Plan of Operation (APO) starting from 2024-25 to 2033-34 is represented in the table below.

Table: 3.2 Regional Wildlife Management Plan (RWLMP) Annual Plan of Operation (APO) financial Outlay

The abstract of financial outlay for each year is represented in the table below.

Sl. No.	Financial Year	APO Outlay (Rs. In in Lakh.)
1	2024-25	9500
2	2025-26	7700
3	2026-27	7100
4	2027-28	6900
5	2028-29	6400
6	2029-30	6400
7	2030-31	6400
8	2031-32	6400
9	2032-33	6400
10	2033-34	6400
Total		**69600**

The detailed financial outlay on the proposed activities is described in the table in the subsequent pages for each of the financial year ranging from 2024-25 to 2033-34.

Regional Wildlife Management Plan of APO 2024-25

Regional Wildlife Management Plan of APO 2024-25

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- Elephant Census	Elephant census exercise - 2024	Divisions having rare elephant presence : 10 Divisions - Mangrove WL, City, Jeypore, Nawarangpur, Koraput, Khariar, Sunabeda WL, Chilika, Bhadrak, Puri		0.25	10	2.50
			Divisions having higher elephant population : 41 Divisions - Angul, Athmallik, Athgarh, Dhenkanal, Balasore WL, Keonjhar WL, Rairangpur, Berhampur, Ghumsur North, Ghumsur South, Subarnapur, Kalahandi North, Kalahandi South, Nayagarh, Bonai, Deogarh, Rourkela, Sundargarh, Sambalpur,Cuttack, Satkosia WL, Mahanadi WL, Karanjia, Baripada, Similipal South, Similipal North, Balliguda, Boudh, Phulbani, Bolangir, Puri, Chandaka WL, Khordha, Rayagada, Keonjhar- T, Jharsuguda, Redhakhol, Bamra WL, Bargarh, Hirakud WL, Parlakhemundi		0.5	41	20.50
	2- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	3- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	4- Crocodile Census						
	5- Dolphin Census						
	Total:-						**109.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
			4- Arachandi, Chattisapata etc				
	Total:-						**30.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak		4.00	50	100.00
	2- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				100.00
	3- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	4- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	5- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				30.00
	6- Indian Skimmer and Black Bellied Tern	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	7- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	8- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	9- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	10- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	11- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				50.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**346.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	100 ha.	90.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	300 Ha.	135.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	500ha.	169.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	35	252.00
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**668.00**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	2 km	40.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		30.00
	Total:-						**100.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
F. Active Wildlife Management:-							
Active wildlife management aims towards reintroduction and augmentation of wildlife, conflict management related various wildlife species, scientific management of selected species in their natural habitat of the state using advance veterinary intervention and specially developed protocols of reintroduction and augmentation with all statutory permission.	1- Tiger & other large carnivore	Active management of these Scheduled WL species are to be prioritsed as per their ecological role, suitability of habitat, historical records. Their long term conservation requires intensive monitoring, effective protection, habitat improvement, and need based research with all statutory permissions.	Throughout the state		LS		100.00
	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	10	500.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	10	300.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	10	250.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		100.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		200.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	10	65.00
	Total:-						**1425.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					500.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						300.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
	4- Kunki Elephant Training Programme						20.00
	5- Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit	Exposure visits to different Pas, elephant rescue centresand elephant transit house,vet hospitals etc					20.00
	Total:-						**850.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
I. Wildlife Conflict Management:-							
Mitigation of wildlife conflict management through introduction of trained Rapid Response Teams & skilled ex-military serviceman to be ensured. Other corrective measures like solar fencing, barricading of open well, procurement of drones, AI & ML based surveillance system are to be utilized in conflict prone areas.	1- New Rapid Response Team formation, Vehicle & Equipment	Rapid Response Team formation along with vehicle procurement, customisation and equipment procurement					450.00
	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military, other special squads & dog squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					666.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					150.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					600.00
	Total:-						**2276.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					500.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					250.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					110.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					100.00
	Total:-						**960.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					40.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					150.00
							190.00

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					300.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					150.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					30.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**540.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					150.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					50.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					25.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					25.00
	Total:-						**280.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					23.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competi-tionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**58.50**
P. Training & Capacity Building:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- State level training						120.00
	2- Regional level training						16.00
	3- Division level training						52.00
	4- State level meeting & workshop						20.00
	5- Inter-state coordination meeting & workshop						10.00
	6- Exposure visit for forest officials to different PAs						40.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**308.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						55.00
	Total:-						**155.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
R. Research & Development:-							
Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						70.00
	4- Establishment of Field level Research Centre						10.00
	Total:-						**220.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						100.00
	2- Personal gears & safety equipment						50.00
	3- Logistics & equipment support to field establishments						24.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**194.50**
	Grand Total:-						**9500.00**

Regional Wildlife Management Plan of APO 2025-26

Regional Wildlife Management Plan of APO 2025-26

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	2- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	3- Crocodile Census						
	4- Dolphin Census						
	Total:-						**86.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
	Total:-						**30.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Olive Ridley Turtle	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support & nesting area management	Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur			LS	80.00
	2- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak			LS	80.00
	3- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				70.00
	4- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	5- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	6- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				30.00
	7- Indian Skimmer	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	8- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	9- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	10- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	11- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	12- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				40.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**366.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	90 ha.	80.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	250 Ha.	120.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	400ha.	150.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	25	280.00
		Riverine ecosystem of Mahanadi River	Throughout the state in WL habitat		2.00	50	
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	8- Unique & Special Habitat Mapping & Management	Mapping, monitoring of Caves, snags, rocky outgrowth, wetlands, saltlicks, waterfalls, amphibian habitat, wallowing area including all unique/special geological and biological areas in all 51 divisions.	Throughout the state		0.50	51	2.55
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**654.55**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	2 km	40.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		20.00
	Total:-						**90.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
F. Active Wildlife Management:-							
Active wildlife management aims towards reintroduction and augmentation of wildlife, conflict management related various wildlife species, scientific management of selected species in their natural habitat of the state using advance veterinary intervention and specially developed protocols of reintroduction and augmentation with all statutory permission.	1- Tiger & other large carnivore	Active management of these Scheduled WL species are to be prioritsed as per their ecological role, suitability of habitat, historical records. Their long term conservation requires intensive monitoring, effective protection, habitat improvement, and need based research with all statutory permissions.	Throughout the state		LSt		100.00
	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	8	280.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	8	240.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	8	200.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		100.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		200.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	6	39.00
	Total:-						**1069.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					200.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						200.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
	4- Kunki Elephant Training Programme						20.00
	5- Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit	Exposure visits to different Pas, elephant rescue centresand elephant transit house,vet hospitals etc					20.00
	Total:-						**450.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
I. Wildlife Conflict Management:-							
Mitigation of wildlife conflict management through introduction of trained Rapid Response Teams & skilled ex-military serviceman to be ensured. Other corrective measures like solar fencing, barricading of open well, procurement of drones, AI & ML based surveillance system are to be utilized in conflict prone areas.	1- New Rapid Response Team formation, Vehicle & Equipment	Rapid Response Team formation along with vehicle procurement, customisation and equipment procurement					150.00
	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military & other special squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					500.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					50.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					400.00
	Total:-						**1600.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					200.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					200.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					10.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					80.00
	Total:-						**490.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					200.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					150.00
	Total:-						**350.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					250.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					100.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					30.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**440.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					50.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					50.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	Total:-						**230.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					115.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competitionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**150.50**
P. Training & Capacity Building:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- State level training						120.00
	2- Regional level training						16.00
	3- Division level training						52.00
	4- State level meeting & workshop						20.00
	5- Inter-state coordination meeting & workshop						10.00
	6- Exposure visit for forest officials to different PAs						80.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**348.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						40.00
	Total:-						**140.00**

Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
R. Research & Development:-							
Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						70.00
	4- Establishment of Field level Research Centre						80.00
	Total:-						**290.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						50.00
	2- Personal gears & safety equipment						100.00
	3- Logistics & equipment support to field establishments						25.45
	4- Incentivization for staff for use of latest technology & best practices						20.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**215.45**
	Grand Total:-						**7700.00**

Regional Wildlife Management Plan of APO 2026-27

Regional Wildlife Management Plan of APO 2026-27

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	2- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	3- Crocodile Census						
	4- Dolphin Census						
	Total:-						**86.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
	Total:-						**30.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Olive Ridley Turtle	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support & nesting area management	Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur			LS	80.00
	2- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak			LS	60.00
	3- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				50.00
	4- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	5- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	6- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				30.00
	7- Indian Skimmer	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	8- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	9- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	10- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	11- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	12- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				40.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**326.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	70 ha.	70.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	200 Ha	100.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	350ha.	120.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	25	280.00
		Riverine ecosystem of Mahanadi River	Throughout the state in WL habitat		2.00	50	
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	8- Unique & Special Habitat Mapping & Management	Mapping, monitoring of Caves, snags, rocky outgrowth, wetlands, saltlicks, waterfalls, amphibian habitat, wallowing area including all unique/special geological and biological areas in all 51 divisions.	Throughout the state		0.50	51	2.55
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**538.55**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	1 km	20.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		20.00
	Total:-						**70.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
F. Active Wildlife Management:-							
Active wildlife management aims towards reintroduction and augmentation of wildlife, conflict management related various wildlife species, scientific management of selected species in their natural habitat of the state using advance veterinary intervention and specially developed protocols of reintroduction and augmentation with all statutory permission.	1- Tiger & other large carnivore	Active management of these Scheduled WL species are to be prioritsed as per their ecological role, suitability of habitat, historical records. Their long term conservation requires intensive monitoring, effective protection, habitat improvement, and need based research with all statutory permissions.	Throughout the state		LSt		100.00
	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	7	245.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	7	210.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	6	150.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		80.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		150.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	6	39.00
	Total:-						**884.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					150.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						150.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
	4- Kunki Elephant Training Programme						20.00
	5- Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit	Exposure visits to different Pas, elephant rescue centresand elephant transit house,vet hospitals etc					20.00
	Total:-						**350.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
I. Wildlife Conflict Management:-							
Mitigation of wildlife conflict management through introduction of trained Rapid Response Teams & skilled ex-military serviceman to be ensured. Other corrective measures like solar fencing, barricading of open well, procurement of drones, AI & ML based surveillance system are to be utilized in conflict prone areas.	1- New Rapid Response Team formation, Vehicle & Equipment	Rapid Response Team formation along with vehicle procurement, customisation and equipment procurement					150.00
	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military & other special squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					500.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					50.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					400.00
	Total:-						**1600.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					200.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					200.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					10.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					80.00
	Total:-						**490.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					150.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					50.00
	Total:-						**200.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					250.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					100.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					30.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**440.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					50.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					50.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	Total:-						**230.00**

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O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					115.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competitionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**150.50**
P. Training & Capacity Building:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- State level training						120.00
	2- Regional level training						16.00
	3- Division level training						52.00
	4- State level meeting & workshop						20.00
	5- Inter-state coordination meeting & workshop						10.00
	6- Exposure visit for forest officials to different PAs						80.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**348.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						40.00
	Total:-						**140.00**

Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
R. Research & Development:-							
Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						100.00
	4- Establishment of Field level Research Centre						80.00
	Total:-						**320.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						50.00
	2- Personal gears & safety equipment						80.00
	3- Logistics & equipment support to field establishments						26.45
	4- Incentivization for staff for use of latest technology & best practices						20.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**196.45**
	Grand Total:-						**7100.00**

Regional Wildlife Management Plan of APO 2027-28

Regional Wildlife Management Plan of APO 2027-28

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	2- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	3- Crocodile Census						
	4- Dolphin Census						
	Total:-						**86.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
	Total:-						**30.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Olive Ridley Turtle	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support & nesting area management	Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur			LS	80.00
	2- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak			LS	30.00
	3- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				30.00
	4- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	5- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	6- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				30.00
	7- Indian Skimmer	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	8- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	9- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	10- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	11- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	12- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				40.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**276.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	50 ha.	50.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	140 Ha.	70.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	220ha.	70.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	16	175.00
		Riverine ecosystem of Mahanadi River	Throughout the state in WL habitat		2.00	30	
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	8- Unique & Special Habitat Mapping & Management	Mapping, monitoring of Caves, snags, rocky outgrowth, wetlands, saltlicks, waterfalls, amphibian habitat, wallowing area including all unique/special geological and biological areas in all 51 divisions.	Throughout the state		0.50	51	2.55
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**389.75**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	1 km	20.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		20.00
	Total:-						**70.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
F. Active Wildlife Management:-							
Active wildlife management aims towards reintroduction and augmentation of wildlife, conflict management related various wildlife species, scientific management of selected species in their natural habitat of the state using advance veterinary intervention and specially developed protocols of reintroduction and augmentation with all statutory permission.	1- Tiger & other large carnivore	Active management of these Scheduled WL species are to be prioritsed as per their ecological role, suitability of habitat, historical records. Their long term conservation requires intensive monitoring, effective protection, habitat improvement, and need based research with all statutory permissions.	Throughout the state		LS		100.00
	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	7	245.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	7	210.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	6	150.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		80.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		150.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	6	39.00
	Total:-						**884.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					150.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						150.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
	4- Kunki Elephant Training Programme						20.00
	5- Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit	Exposure visits to different Pas, elephant rescue centresand elephant transit house,vet hospitals etc					20.00
	Total:-						**350.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
I. Wildlife Conflict Management:-							
Mitigation of wildlife conflict management through introduction of trained Rapid Response Teams & skilled ex-military serviceman to be ensured. Other corrective measures like solar fencing, barricading of open well, procurement of drones, AI & ML based surveillance system are to be utilized in conflict prone areas.	1- New Rapid Response Team formation, Vehicle & Equipment	Rapid Response Team formation along with vehicle procurement, customisation and equipment procurement					150.00
	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military & other special squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					500.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					50.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					400.00
	Total:-						**1600.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					200.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					200.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					10.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					80.00
	Total:-						**490.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					150.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					50.00
	Total:-						**200.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					250.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					100.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					30.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**440.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					50.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					50.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	Total:-						**230.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					115.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competi-tionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**150.50**
P. Training & Capacity Building:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- State level training						120.00
	2- Regional level training						16.00
	3- Division level training						52.00
	4- State level meeting & workshop						20.00
	5- Inter-state coordination meeting & workshop						10.00
	6- Exposure visit for forest officials to different PAs						80.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**348.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						40.00
	Total:-						**140.00**

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R. Research & Development:-							
Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						100.00
	4- Establishment of Field level Research Centre						80.00
	Total:-						**320.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						50.00
	2- Personal gears & safety equipment						80.00
	3- Logistics & equipment support to field establishments						25.25
	4- Incentivization for staff for use of latest technology & best practices						20.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**195.25**
	Grand Total:-						**6900.00**

Regional Wildlife Management Plan of APO 2028-29

Regional Wildlife Management Plan of APO 2028-29

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A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	2- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	3- Crocodile Census						
	4- Dolphin Census						
	Total:-						**86.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
	Total:-						**30.00**

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C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Olive Ridley Turtle	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support & nesting area management	Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur			LS	80.00
	2- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak			LS	30.00
	3- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				30.00
	4- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	5- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	6- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				20.00
	7- Indian Skimmer	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	8- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	9- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	10- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	11- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	12- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				40.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**266.00**

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D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	50 ha.	50.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	150 Ha.	80.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	180ha.	50.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	16	175.20
		Riverine ecosystem of Mahanadi River	Throughout the state in WL habitat		2.00	30	
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	8- Unique & Special Habitat Mapping & Management	Mapping, monitoring of Caves, snags, rocky outgrowth, wetlands, saltlicks, waterfalls, amphibian habitat, wallowing area including all unique/special geological and biological areas in all 51 divisions.	Throughout the state		0.50	51	2.55
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**379.75**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	1 km	20.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		20.00
	Total:-						**60.00**

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F. Active Wildlife Management:-							
Active wildlife management aims towards reintroduction and augmentation of wildlife, conflict management related various wildlife species, scientific management of selected species in their natural habitat of the state using advance veterinary intervention and specially developed protocols of reintroduction and augmentation with all statutory permission.	1- Tiger & other large carnivore	Active management of these Scheduled WL species are to be prioritsed as per their ecological role, suitability of habitat, historical records. Their long term conservation requires intensive monitoring, effective protection, habitat improvement, and need based research with all statutory permissions.	Throughout the state		LSt		100.00
	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	8	210.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	8	180.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	8	150.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		80.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		100.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	6	33.00
	Total:-						**763.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					120.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						150.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
	4- Kunki Elephant Training Programme						20.00
	5- Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit	Exposure visits to different Pas, elephant rescue centresand elephant transit house,vet hospitals etc					20.00
	Total:-						**320.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
I. Wildlife Conflict Management:-							
Mitigation of wildlife conflict management through introduction of trained Rapid Response Teams & skilled ex-military serviceman to be ensured. Other corrective measures like solar fencing, barricading of open well, procurement of drones, AI & ML based surveillance system are to be utilized in conflict prone areas.	1- New Rapid Response Team formation, Vehicle & Equipment	Rapid Response Team formation along with vehicle procurement, customisation and equipment procurement					120.00
	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military & other special squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					500.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					50.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					400.00
	Total:-						**1570.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					150.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					150.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					10.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					60.00
	Total:-						**370.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					150.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					50.00
	Total:-						**200.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					200.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					80.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					20.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**360.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					30.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					30.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	Total:-						**190.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					102.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competitionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**137.00**
P. Training & Capacity Building:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- State level training						120.00
	2- Regional level training						16.00
	3- Division level training						52.00
	4- State level meeting & workshop						20.00
	5- Inter-state coordination meeting & workshop						10.00
	6- Exposure visit for forest officials to different PAs						80.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**348.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						40.00
	Total:-						**140.00**

Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
R. Research & Development:-							
Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						100.00
	4- Establishment of Field level Research Centre						60.00
	Total:-						**300.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						50.00
	2- Personal gears & safety equipment						70.00
	3- Logistics & equipment support to field establishments						19.00
	4- Incentivization for staff for use of latest technology & best practices						20.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**179.00**
	Grand Total:-						**6400.00**

Regional Wildlife Management Plan of APO 2029-30

Regional Wildlife Management Plan of APO 2029-30							
	Item of Work prescribed in OSCOW-MAG	**Activities to be undertaken**	**Name of the Location / Circle / Division and brief activities proposed**	**Unit**	**Unit cost (Rs. in Lakh)**	**Quantity / Unit (in No.)**	**Funds proposed (Rs. in Lakh)**
A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	2- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	3- Crocodile Census						
	4- Dolphin Census						
	Total:-						**86.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
	Total:-						**30.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Olive Ridley Turtle	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support & nesting area management	Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur			LS	80.00
	2- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak			LS	30.00
	3- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				30.00
	4- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	5- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	6- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				20.00
	7- Indian Skimmer	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	8- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	9- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	10- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	11- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	12- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				40.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**266.00**

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D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	70 ha.	50.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	200 Ha	80.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	350ha.	50.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	16	175.20
		Riverine ecosystem of Mahanadi River	Throughout the state in WL habitat		2.00	30	
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	8- Unique & Special Habitat Mapping & Management	Mapping, monitoring of Caves, snags, rocky outgrowth, wetlands, saltlicks, waterfalls, amphibian habitat, wallowing area including all unique/special geological and biological areas in all 51 divisions.	Throughout the state		0.50	51	2.55
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**379.75**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	1 km	20.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		10.00
	Total:-						**60.00**

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F. Active Wildlife Management:-							
Active wildlife management aims towards reintroduction and augmentation of wildlife, conflict management related various wildlife species, scientific management of selected species in their natural habitat of the state using advance veterinary intervention and specially developed protocols of reintroduction and augmentation with all statutory permission.	1- Tiger & other large carnivore	Active management of these Scheduled WL species are to be prioritsed as per their ecological role, suitability of habitat, historical records. Their long term conservation requires intensive monitoring, effective protection, habitat improvement, and need based research with all statutory permissions.	Throughout the state		LSt		100.00
	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	7	210.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	7	180.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	6	150.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		80.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		100.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	6	33.00
	Total:-						**763.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					120.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						150.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
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	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military & other special squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					500.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					50.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					400.00
	Total:-						**1570.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					150.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					150.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					10.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					60.00
	Total:-						**370.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					150.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					50.00
	Total:-						**200.00**

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L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					200.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					80.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					20.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**360.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					30.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					30.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	Total:-						**190.00**

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O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					102.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competitionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**137.50**
P. Training & Capacity Building:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- State level training						120.00
	2- Regional level training						16.00
	3- Division level training						52.00
	4- State level meeting & workshop						20.00
	5- Inter-state coordination meeting & workshop						10.00
	6- Exposure visit for forest officials to different PAs						80.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**348.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						40.00
	Total:-						**140.00**

Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
R. Research & Development:-							
Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						100.00
	4- Establishment of Field level Research Centre						60.00
	Total:-						**300.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						50.00
	2- Personal gears & safety equipment						70.00
	3- Logistics & equipment support to field establishments						19.25
	4- Incentivization for staff for use of latest technology & best practices						20.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**179.25**
	Grand Total:-						**6400.00**

Regional Wildlife Management Plan of APO 2030-31

Regional Wildlife Management Plan of APO 2030-31

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	2- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	3- Crocodile Census						
	4- Dolphin Census						
	Total:-						**86.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
	Total:-						**30.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Olive Ridley Turtle	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support & nesting area management	Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur			LS	80.00
	2- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak			LS	30.00
	3- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				30.00
	4- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	5- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	6- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				20.00
	7- Indian Skimmer	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	8- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	9- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	10- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	11- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	12- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				40.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**266.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	50 ha.	50.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	150 Ha.	80.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	180ha.	50.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	16	175.00
		Riverine ecosystem of Mahanadi River	Throughout the state in WL habitat		2.00	30	
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	8- Unique & Special Habitat Mapping & Management	Mapping, monitoring of Caves, snags, rocky outgrowth, wetlands, saltlicks, waterfalls, amphibian habitat, wallowing area including all unique/special geological and biological areas in all 51 divisions.	Throughout the state		0.50	51	2.55
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**379.75**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	1 km	20.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		10.00
	Total:-						**60.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
F. Active Wildlife Management:-							
Active wildlife management aims towards reintroduction and augmentation of wildlife, conflict management related various wildlife species, scientific management of selected species in their natural habitat of the state using advance veterinary intervention and specially developed protocols of reintroduction and augmentation with all statutory permission.	1- Tiger & other large carnivore	Active management of these Scheduled WL species are to be prioritsed as per their ecological role, suitability of habitat, historical records. Their long term conservation requires intensive monitoring, effective protection, habitat improvement, and need based research with all statutory permissions.	Throughout the state		LS		100.00
	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	7	210.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	7	180.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	6	150.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		80.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		100.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	6	33.00
	Total:-						**763.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					120.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						150.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
	4- Kunki Elephant Training Programme						20.00
	5- Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit	Exposure visits to different Pas, elephant rescue centresand elephant transit house,vet hospitals etc					20.00
	Total:-						**320.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
I. Wildlife Conflict Management:-							
Mitigation of wildlife conflict management through introduction of trained Rapid Response Teams & skilled ex-military serviceman to be ensured. Other corrective measures like solar fencing, barricading of open well, procurement of drones, AI & ML based surveillance system are to be utilized in conflict prone areas.	1- New Rapid Response Team formation, Vehicle & Equipment	Rapid Response Team formation along with vehicle procurement, customisation and equipment procurement					120.00
	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military & other special squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					500.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					50.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					400.00
	Total:-						**1570.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					150.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					150.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					10.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					60.00
	Total:-						**370.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					150.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					50.00
	Total:-						**200.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					200.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					80.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					20.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**360.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					30.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					30.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	Total:-						**190.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					102.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competi-tionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**137.50**
P. Training & Capacity Building:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- State level training						120.00
	2- Regional level training						16.00
	3- Division level training						52.00
	4- State level meeting & workshop						20.00
	5- Inter-state coordination meeting & workshop						10.00
	6- Exposure visit for forest officials to different PAs						80.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**348.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						40.00
	Total:-						**140.00**

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R. Research & Development:-							
Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						100.00
	4- Establishment of Field level Research Centre						60.00
	Total:-						**300.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						50.00
	2- Personal gears & safety equipment						70.00
	3- Logistics & equipment support to field establishments						19.25
	4- Incentivization for staff for use of latest technology & best practices						20.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**179.25**
	Grand Total:-						**6400.00**

Regional Wildlife Management Plan of APO 2031-32

Regional Wildlife Management Plan of APO 2031-32

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	2- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	3- Crocodile Census						
	4- Dolphin Census						
	Total:-						**86.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
	Total:-						**30.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Olive Ridley Turtle	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support & nesting area management	Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur			LS	80.00
	2- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak			LS	30.00
	3- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				30.00
	4- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	5- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	6- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				20.00
	7- Indian Skimmer	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	8- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	9- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	10- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	11- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	12- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				40.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**266.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	50 ha.	50.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	150 Ha.	80.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	180ha.	50.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	16	175.20
		Riverine ecosystem of Mahanadi River	Throughout the state in WL habitat		2.00	30	
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	8- Unique & Special Habitat Mapping & Management	Mapping, monitoring of Caves, snags, rocky outgrowth, wetlands, saltlicks, waterfalls, amphibian habitat, wallowing area including all unique/special geological and biological areas in all 51 divisions.	Throughout the state		0.50	51	2.55
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**379.75**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	1 km	20.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		20.00
	Total:-						**60.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
F. Active Wildlife Management:-							
Active wildlife management aims towards reintroduction and augmentation of wildlife, conflict management related various wildlife species, scientific management of selected species in their natural habitat of the state using advance veterinary intervention and specially developed protocols of reintroduction and augmentation with all statutory permission.	1- Tiger & other large carnivore	Active management of these Scheduled WL species are to be prioritsed as per their ecological role, suitability of habitat, historical records. Their long term conservation requires intensive monitoring, effective protection, habitat improvement, and need based research with all statutory permissions.	Throughout the state		LSt		100.00
	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	8	210.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	8	180.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	8	150.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		80.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		100.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	6	33.00
	Total:-						**763.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					120.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						150.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
	4- Kunki Elephant Training Programme						20.00
	5- Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit	Exposure visits to different Pas, elephant rescue centresand elephant transit house,vet hospitals etc					20.00
	Total:-						**320.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
I. Wildlife Conflict Management:-							
Mitigation of wildlife conflict management through introduction of trained Rapid Response Teams & skilled ex-military serviceman to be ensured. Other corrective measures like solar fencing, barricading of open well, procurement of drones, AI & ML based surveillance system are to be utilized in conflict prone areas.	1- New Rapid Response Team formation, Vehicle & Equipment	Rapid Response Team formation along with vehicle procurement, customisation and equipment procurement					120.00
	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military & other special squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					500.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					50.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					400.00
	Total:-						**1570.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					150.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					150.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					10.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					60.00
	Total:-						**370.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					150.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					50.00
	Total:-						**200.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					200.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					80.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					20.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**360.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					30.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					30.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	Total:-						**190.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					102.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competitionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**137.00**
P. Training & Capacity Building:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- State level training						120.00
	2- Regional level training						16.00
	3- Division level training						52.00
	4- State level meeting & workshop						20.00
	5- Inter-state coordination meeting & workshop						10.00
	6- Exposure visit for forest officials to different PAs						80.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**348.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						40.00
	Total:-						**140.00**

Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
R. Research & Development:-							
Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						100.00
	4- Establishment of Field level Research Centre						60.00
	Total:-						**300.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						50.00
	2- Personal gears & safety equipment						70.00
	3- Logistics & equipment support to field establishments						19.00
	4- Incentivization for staff for use of latest technology & best practices						20.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**179.00**
	Grand Total:-						**6400.00**

Regional Wildlife Management Plan of APO 2032-33

Regional Wildlife Management Plan of APO 2032-33							
	Item of Work prescribed in OSCOW-MAG	**Activities to be undertaken**	**Name of the Location / Circle / Division and brief activities proposed**	**Unit**	**Unit cost (Rs. in Lakh)**	**Quantity / Unit (in No.)**	**Funds proposed (Rs. in Lakh)**
A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	2- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	3- Crocodile Census						
	4- Dolphin Census						
	Total:-						**86.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
	Total:-						**30.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Olive Ridley Turtle	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support & nesting area management	Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur			LS	80.00
	2- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak			LS	30.00
	3- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				30.00
	4- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	5- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	6- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				20.00
	7- Indian Skimmer	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	8- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	9- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	10- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	11- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	12- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				40.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**266.00**

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D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	70 ha.	50.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	200 Ha	80.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	350ha.	50.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	16	175.20
		Riverine ecosystem of Mahanadi River	Throughout the state in WL habitat		2.00	30	
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	8- Unique & Special Habitat Mapping & Management	Mapping, monitoring of Caves, snags, rocky outgrowth, wetlands, saltlicks, waterfalls, amphibian habitat, wallowing area including all unique/special geological and biological areas in all 51 divisions.	Throughout the state		0.50	51	2.55
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**379.75**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	1 km	20.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		10.00
	Total:-						**60.00**

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	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	7	210.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	7	180.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	6	150.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		80.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		100.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	6	33.00
	Total:-						**763.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					120.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						150.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
	4- Kunki Elephant Training Programme						20.00
	5- Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit	Exposure visits to different Pas, elephant rescue centresand elephant transit house,vet hospitals etc					20.00
	Total:-						**320.00**

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Mitigation of wildlife conflict management through introduction of trained Rapid Response Teams & skilled ex-military serviceman to be ensured. Other corrective measures like solar fencing, barricading of open well, procurement of drones, AI & ML based surveillance system are to be utilized in conflict prone areas.	1- New Rapid Response Team formation, Vehicle & Equipment	Rapid Response Team formation along with vehicle procurement, customisation and equipment procurement					120.00
	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military & other special squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					500.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					50.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					400.00
	Total:-						**1570.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					150.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					150.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					10.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					60.00
	Total:-						**370.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					150.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					50.00
	Total:-						**200.00**

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L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					200.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					80.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					20.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**360.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					30.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					30.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	Total:-						**190.00**

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O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					102.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competitionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**137.50**
P. Training & Capacity Building:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- State level training						120.00
	2- Regional level training						16.00
	3- Division level training						52.00
	4- State level meeting & workshop						20.00
	5- Inter-state coordination meeting & workshop						10.00
	6- Exposure visit for forest officials to different PAs						80.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**348.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						40.00
	Total:-						**140.00**

Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
R. Research & Development:-							
Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						100.00
	4- Establishment of Field level Research Centre						60.00
	Total:-						**300.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						50.00
	2- Personal gears & safety equipment						70.00
	3- Logistics & equipment support to field establishments						19.25
	4- Incentivization for staff for use of latest technology & best practices						20.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**179.25**
	Grand Total:-						**6400.00**

Regional Wildlife Management Plan of APO 2033-34

Regional Wildlife Management Plan of APO 2033-34

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
A. Wildlife Estimation & Census Esercise:-							
Annual wildlife estimation and census exercise in various habitats give a fair idea on abundance, density, immigration & emigration, breeding behavior, seasonal movement & protection status of various schedule wildlife species of the state. Training, capacity building, equipment procurement, field exercise and census report publications will create a cadre of scientifically oriented wildlife managers and field officials in the state.	1- All Odisha Tiger, Co-pretators & Prey Estimation		Circle Level training		1.25	8	10.00
			Division Level training & exercise, Procurement of equipment		1.00	51	51.00
	2- Bird Census (including resident birds & heronry monitoring)	Training logistics cost of procurement of equipment and durebles.	All 51 divisions for birds and selected divisions for crocodiles & dolphins		LS	LS	25.50
	3- Crocodile Census						
	4- Dolphin Census						
	Total:-						**86.50**
B. Monitoring of PAs & Wetlands:-							
Management Effectiveness Evaluation is a framework for assessing the management effectiveness of various Protected Areas of the state. This internal MEE process will be a great tool for long term planning of scientific interventions, budget allocation, policy decisions making and evaluation of possible outputs and outcomes.	1- Internal Management Effectiveness Evaluation (MEE) of Protected Areas	Internal Annual monitoring effectiveness of all PAs under the guidance of PCCF WL. Teams will be formed and protocol will be prepared by State WL HQ, BBSR.	1- Nalabana, Balukhand, Gahirmatha, Bhitarkanika WLS, Bhitarkanika NP		LS	20	30.00
			2- Kotagarh, Lakhari Valley, Karlapat, Sunabeda				
			3- Similipal, Kuldiha, Hadgarh, Satkosia, Baisipali				
			4- Debrigarh, Badrama, Khalasuni				
			5- Kapilash, Chandaka, Nandankanan				
As wetlands are very dynamic ecological unit, scientific preparation of annual health cards will be helpful in analyzing our interventions, status of biotic, abiotic and anthropogenic pressure and their impact on the health of our important wetlands	2- Preparation of Annual Health Card of Important Wetlands	Annual health cards will be prepared for all important wetlands including the Ramsar sites.	1-Tampara			10	
			2- Satkosia Gorge				
			3- Hirakud				
	Total:-						**30.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
C. Species Specific Conservation Plan:-							
Species specific conservation initiatives are to be planned for conservation, protection and management of selected iconic, keystone & important WL species through habitat interventions, development of scientific monitoring protocol, equipment & vehicle/boat procurement, awareness creation, operational cost, protection of conservation, staff engagement and other ancillary activities.	1- Olive Ridley Turtle	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support & nesting area management	Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur			LS	80.00
	2- Salt Water Crocodile	Procurement of RRT boats, team formation, equipment , awareness generation and fencing, safe bathing ghats for monitoring & management of salt water crocodile-Human interaction	MFD (Rajnagar) & Bhadrak			LS	30.00
	3- Dolphin	Procurement of New trawlers/Speed boats/ support boats..Operational cost of monitoring, staffs support, habitat management and rescue, rehabilitation and release of dolphins	Chilika, Balasore WL, Bhadrak WL, MFD (Rajnagar), Puri, Berhampur				30.00
	4- Sloth Bear	Human-bear conflict management	Throughout the sloth bear habitat				15.00
	5- Pangolin	Conservation, management & protection	Throughout the pangolin habitat				5.00
	6- Blackbuck	Conservation, management, protection & Reintroduction programme	Ghumsur North, Ghumsur South, Nayagarh & Puri				20.00
	7- Indian Skimmer	Protection, monitoring and management of habitat & nesting site of Indian skimmer	Riverine ecosystem of Mahanadi River				5.00
	8- Mangrove Pitta	Monitoring & Conservation of Mangrove Pitta	MFD (Rajnagar)				2.00
	9- Fresh Water Turtle	Monitoring & Conservation of Fresh Water Turtles	Throughout the state in fresh water turtles habitat				2.00
	10- Fishing Cat & other small carnivores	Protection, monitoring and management of small carnivores	Throughout the habitat				2.00
	11- Gaur	Conservation, monitoring, protection & Species recovery programm	Throughout the state in Gaur habitat				25.00
	12- Prey Augmentation & reintroduction of herbivores	Augmentation & reintroduction of important herbivores in various WL habitat	Selected sites				40.00
	12- RET flora & other important flora in WL habitat	Conservation, management, rotection & propagation	Throughout the state				10.00
	Total:-						**266.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
D. Wildlife Habitat Management:-							
Habitat improvement interventions are the basic requirement for the wildlife in and around the Protected Areas which ensures availability of food & fodder, less interface with livestock, water availability, forest fire management and mapping of unique & special habitat for the scheduled species conservation and management.	1- Creation of Meadow	Survey, demarcation & creation of meadow	Protected Areas & important WL habitat		200/MD	50 ha.	50.00
	2- Management of old Meadow	Management of previously created meadow	Protected Areas & important WL habitat		100/MD	150 Ha.	80.00
	3- Invasive Weed Management	Invasive weed management in important WL habitat	Protected Areas & important WL habitat		75/MD	180ha.	50.00
	4- Management of livestock grazing pressure in Forest Blocks	Interventions to reduce livestock grazing pressure inside FB	Similipal, Satkosia & important PAs/ Wetland				5.00
	5- Captive Livestock Fodder Plantation outside FB through VSS/EDC/ Community engagement	interventions for facilitating food & fodder to livestocks out the forest block thereby reducing grazing pressure inside WL habitat	Fringe areas of Protected Areas				10.00
	6- Pond/ Waterbody Creation & Maintenance	Water body creation in WL habitat	Throughout the state in Wildlife habitat		7.20	16	175.00
		Riverine ecosystem of Mahanadi River	Throughout the state in WL habitat		2.00	30	
	7- Saltlick Creation & management	Saltlick creation & management of old salt licks in WL habitat	Protected Areas & important WL habitat		0.50	10	5.00
	8- Unique & Special Habitat Mapping & Management	Mapping, monitoring of Caves, snags, rocky outgrowth, wetlands, saltlicks, waterfalls, amphibian habitat, wallowing area including all unique/special geological and biological areas in all 51 divisions.	Throughout the state		0.50	51	2.55
	9- Forest Fire Management	Mitigation & monitoring of Forest Fire	Protected Areas & important WL habitat				2.00
	Total:-						**379.75**
E. Mangrove Habitat Management:-							
These interventions are targeted towards the conservation and management of unique mangrove habitat of the state through protection measures, heronry management, ensuring tidal water flow, enhancement of tourist experience and reduction of human wildlife conflict in the mangrove forest.	1- Perimeter Fencing for protection & management of Mangrove Forest	Protection of mangrove forest & reduction of HWC & encroachment	MFD (Rajnagar), Balasore, Puri & Bhadrak		20.00	1 km	20.00
	2- Fishbone Channel Digging	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		LS		10.00
	3- Creek renovation	to facilitate tidal inundation for mangrove forest	MFD (Rajnagar), Balasore, Puri & Bhadrak		1	10 km	10.00
	4- Heronry Management	Monitoring and management of heronry in the state	Throughout the state		LS		10.00
	5- Nature Trail & Patrolling Route Improvement	Protected Areas & important WL habitat	Protected Areas & important WL habitat		LS		10.00
	Total:-						**60.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
F. Active Wildlife Management:-							
Active wildlife management aims towards reintroduction and augmentation of wildlife, conflict management related various wildlife species, scientific management of selected species in their natural habitat of the state using advance veterinary intervention and specially developed protocols of reintroduction and augmentation with all statutory permission.	1- Tiger & other large carnivore	Active management of these Scheduled WL species are to be prioritsed as per their ecological role, suitability of habitat, historical records. Their long term conservation requires intensive monitoring, effective protection, habitat improvement, and need based research with all statutory permissions.	Throughout the state		LS		100.00
	2- Elephant						
	3- Gaur						
	4- Blackbuck						
	5- Sambar						
	6- Spotted Deer						
	7- Salt Water Crocodile & etc						
	8- Development & maintenance of mini zoos, deer parks etc						
	Total:-						**100.00**
G. Infrastructure Development:-							
The protection and communication infrastructure development and maintenance are to be executed in all Protected Areas & major wildlife habitats for ensuring protection, monitoring and scientific management of wildlife.	1- Composite Unit	Composite unit consists of Watch tower/ staff barrack, meadow, waterbody, salt lick etc			35.00	7	210.00
	2- Protection barrack	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			30.00	7	180.00
	3- Watch Tower	Protection barrack with communication network, water facility, electricity/ solar power and basic camp equipment			25.00	6	150.00
	4- Electricity & Solar Power System	Provision of electricity and solar power to field establishments			LS		80.00
	5- Tube well & Dug well provision	Provision of safe drinking water & potable water for field establishments			LS		100.00
	6- VHF new & repair, Control Room	VHF network establishment & maintenance			LS		10.00
	7- VSAT / data and mobile connection	Provision of Data connection to the last mile field sestablishments			6.5	6	33.00
	Total:-						**763.00**
H. Captive Elephant Management							
Well trained captive elephants (kunki) management is the major requirement of various active wildlife management projects and conflict reduction interventions. Their training, housing, transport, training of mahouts are to be taken care of. Exposure visit of mahouts, vets, support staff to the other elephant camps of the country are to be conducted regularly.	1- Elephant Transit House & other ancillary unit Construction & Maintenance	Construction & maintenance of Elephant Transit House & other ancillary unit					120.00
	2- Kumki Elephant Feeding, Health Management & other operational cost						150.00
	3- Elephant Transportation	Inter & intra state transportation of elephants					10.00
	4- Kunki Elephant Training Programme						20.00
	5- Capacity Building of Forest officers, Vets, Staff, Mahouts, Support staff & exposure visit	Exposure visits to different Pas, elephant rescue centresand elephant transit house,vet hospitals etc					20.00
	Total:-						**320.00**

	Item of Work prescribed in OSCOW-MAG	Activities to be undertaken	Name of the Location / Circle / Division and brief activities proposed	Unit	Unit cost (Rs. in Lakh)	Quantity / Unit (in No.)	Funds proposed (Rs. in Lakh)
I. Wildlife Conflict Management:-							
Mitigation of wildlife conflict management through introduction of trained Rapid Response Teams & skilled ex-military serviceman to be ensured. Other corrective measures like solar fencing, barricading of open well, procurement of drones, AI & ML based surveillance system are to be utilized in conflict prone areas.	1- New Rapid Response Team formation, Vehicle & Equipment	Rapid Response Team formation along with vehicle procurement, customisation and equipment procurement					120.00
	2- Upgradation of existing RRT	Upgradation of existing R					200.00
	3- RRT operational cost	Operational cost of RRT teams					100.00
	4- Engagement of Ex-military & other special squads for Similipal, satkosia & other important WL habitat	For better enforcement, protection and management, Ex-military personnel and armed special squads will be enagged					500.00
	5- Solar Fencing (Permanent & Temporary)	Erection of Solar fencing to mitigate Human Wildlife Conflicts					100.00
	6- Logistics & operational cost of WL conflict management	Provision of logistics and operational cost for field management of conflicts					50.00
	7- Barricading of Open Well in WL habitat	Open wells in the WL habitat to be protected through barricading.					100.00
	8- Use of modern technological solutions like IR based cameras, Thermal drones, night vision camers, AI& ML based surveillance system & other innovative system	Provision ofmodern technological solutions like IR Thermal drones and night vision binoculars for field staff/ squad, AI & ML based surveillance system & other innovative system for WL monitoring and surveillance in the field					400.00
	Total:-						**1570.00**
J. Wildlife Health Management:-							
Wildlife health management, procurement of drugs, medicines, operational cost, training of field veterinary officers and upgradation of Centre for Wildlife Health, Bhubaneswar are to be done in this financial year for overall health management of wildlife of the state.	1- WL / Zoo Hospital Construction and Maintenance	Maintenance & upgradation of all WL & Zoo hospitals					150.00
	2- Centre for Wildlife Health, Bhubaneswar upgradation, operation & maintenance	Operational cost, new upgradation and maintenance of CWH, Bhubaneswar					150.00
	3- Treatment of Wildlife & other ancillary operational cost	Emergency & elective treatment of Wildlife					10.00
	4- Procurement of Drugs, Medicine and Dart Guns	New generation drugs, projectors, ancillary equipment provisions to be made					60.00
	Total:-						**370.00**
K. Institution & Academy:-							
Establishment of State Wildlife Forensic Cell will be a game changer in the wildlife enforcement activity. It will have all advance lab facilities for crime detection, sampling and wildlife museum facility. State wildlife training centre at Godibari will be upgraded to accommodate more no of participants for conduction of theme based wildlife training.	1- State WL Forensic Cell establishment	State Forensic Lab with Pathology, Morphology, Genetics, Chemistry and histology units with extensive specimen collections with best technical team and equipment to be stablished for supporting WL crime detection and prevention					150.00
	2- State WL Training Centre, Godibari upgradation & maintenance	Upgradation of State WL Training Centre, Godibari					50.00
	Total:-						**200.00**

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L. Community Based WL Conservation Program:-							
Gajasathi engagement from the local community in the conflict prone villages for reduction of human elephant conflicts during winter crop season.	1- Elephant - Gajasathis	Gajastahi enagagemnet in the Human-Elephant conflict prone areas					600.00
	Total:-						**600.00**
M. Equipment & Logistics:-							
Modern equipment like drone, night vision camera, LRF, weather station, binoculars to be procured for field staff for monitoring and management of the wildlife in Protected Areas and other wildlife habitat.	1- Camera Trap	Provision of Camera Traps for scientific monitoring of WL					200.00
	2- Point & Shoot Cameras	High zoom cameras for field staff for monitoring, surveillance & protection.					10.00
	3- Night Vision Camera	Night vision Thermal / IR cameras for field for monitoring, surveillance & protection.					20.00
	4- Drone	Thermal & IR drones for field monitoring of WL, conflict mitigation and surveillance					80.00
	5- Laser Range Finder	Laser Range Finder for scientific monitoring of WL in PA & other important WL rich area					20.00
	6- Weather Stations & data logger	Monitoring of weather and other important environmental data					10.00
	7- Binoculars & Spotting Scope	Binoculars & spotting scope for field staff for monitoring, surveillance & protection.					20.00
	Total:-						**360.00**
N. IEC on WL Management:-							
IEC on species conservation, wildlife conflict mitigation, public awareness creation, VSS/EDC engagement are to be done along-with media and social media campaigns for protection and management of wildlife.	1- Documentary Movie	Documentary movie on important WL issues, PAs, conservation initiatives					30.00
	2- Posters, Banners, Sign boards etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					30.00
	3- Books, Journals, Compendium etc..	For conservation, monitoring of WL and Mitigation of HW conflicts					10.00
	4- Media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	5- Social media campaigns	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					10.00
	6- Awareness campaigns in field through folk art, dance & other traditional way	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	7- VSS/EDC/SHG sensitization	For awareness generation of WL conservation, monitoring, surveillance, HW Conflicts					50.00
	Total:-						**190.00**

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O. Nature Interpretation Exercise:-							
Engagement of young students, fringe villages, ecotourist and wildlife conservation & protection initiatives.	1- UNMADANA:- centralized theme based children interpretation module development & nature interpretation exercise	Theme based awareness on WL conservation, conflict reduction & monitoring					102.00
	2- Night safari						10.00
	3- WL theme based competition in School & College	On important days, theme based competi-tionon WL conservation, conflict reduction & monitoring			0.5	51	25.50
	Total:-						**137.50**
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	3- Division level training						52.00
	4- State level meeting & workshop						20.00
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	6- Exposure visit for forest officials to different PAs						80.00
	7- MOU with reputed international and national institutes/ NGOs/ academies & agencies						50.00
	Total:-						**348.00**
Q. IWildlife Crime Control:-							
JTFs have been constituted on wildlife crime control for important wildlife species of the state.	1- JTFs constitution & operational cost						100.00
	2- Legal awareness and Assistance						40.00
	Total:-						**140.00**

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Long term and need based research on various wildlife themes are the need of the hour. The research needs of the wildlife sectors are to be executed by a state level PMU & engagement of biologists, researchers al local level. Few field level research centers are to be revitalized. Development and annual maintenance of various web-based applications on wildlife management are also included in the proposal.	1- Need based research on WL conservation						100.00
	2- Mobile and Web based application development & operational support						40.00
	3- PMU establishment @ WL HQ						100.00
	4- Establishment of Field level Research Centre						60.00
	Total:-						**300.00**
S. Staff Welfare Measures:-							
As the wildife wing toeca staff and signd remains in operate in very isolated and extreme environment, their walfare needs are to be taken care of.	1- Flexi fund for Squad Wages						50.00
	2- Personal gears & safety equipment						70.00
	3- Logistics & equipment support to field establishments						19.25
	4- Incentivization for staff for use of latest technology & best practices						20.00
	5- Awards & Honours for Officials & squads members						20.00
	Total:-						**179.25**
	Grand Total:-						**6400.00**

Wildlife Organisation
O/o: Principal Chief Conservator of Forests (WL)
and Chief Wildlife Warden, Odisha
Prakruti Bhawan, Plot No. 1459,
Saheed Nagar, Bhubaneswar-751007

E-mail: odishawildlife@gmail.com
Web: www.wildlife.odisha.gov.in

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS (WILDLIFE)
& CHIEF WILDLIFE WARDEN, ODISHA
Government of Odisha, Forest, Environment & Climate Change Department
PRAKRUTI BHAWAN, PLOT NO.1459, SAHEED NAGAR, BHUBANESWAR- 751007
Phone: 0674-2602250, Website: www.wildlife.odisha.gov.in, Email: odishawildlife@gmail.com

No. 11775 / CWLW-FDWC-FD-0011-2023
Dated, Bhubaneswar the 09 October, 2024

To

The General Manager
Subhadra Area, At / PO- Angul
District – Angul, PIN- 759122

Sub: Diversion of 125.24 ha. of forest land for Subhadra OCP Coal Mining Project by M/s Mahanadi Coal Fields Ltd. under Angul Forst Division-Approval of SSWLCP.

Sir,

I am directed to convey the approval of PCCF (WL) & CWLW, Odisha for the Site Specific Wildlife Conservation Plan at a financial outlay of ₹3236.376 Lakh (Rupees Thirty-two Crore Thirty-six Lakh Thirty-seven Thousand Six Hundred) only as per the details of activities mentioned in Chapter-6 of the Plan prepared in compliance to Condition No. 08 of the Stage-I approval granted by MoEF&CC, New Delhi. A sum of ₹3236.376 Lakh (Rupees Thirty-two Crore Thirty-six Lakh Thirty-seven Thousand Six Hundred) only may be deposited in the State CAMPA fund through portal (https://parivesh.nic.in) for the purpose of implementation of various activities within the project impact area in Angul Forest Division.

2. Activities in the project area as per Chapter-6 of the Plan will be executed by the project proponent under the guidance of the concerned DFO. Further, the User Agency shall deposit 5% of the plan cost over and above in the A/c. of the society "The Wildlife Odisha" maintained in this office towards unforeseen interventions.

3. The Plan period is five years and will be revisited by the concerned DFO at least one year before expiry of its implementation. The User Agency will bear the cost of such Plan on its approval. Further, the User Agency will bear additional cost, if any, towards enhancement of wage rate and escalation of price of materials at the time of implementation of this Plan.

P.T.O.

In case of any deviation, it will be dealt as per law for violations of Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980, Environment (Protection) Act 1986 and Wildlife (Protection) Act 1972.

Encl.: Copy of the approved SSWLCP

Yours faithfully,

01/10/2024

Chief Conservator of Forests (WL-III)

Memo. No. 4776 / Dt. 01/10/2024

Copy forwarded for information and necessary action to the: -

1. OSD-cum-Special Secretary to Government of Odisha, FE&CC Department, Bhubaneswar with reference to that Department Memo No. 25837/ FE&CC dated 14.12.2023 addressed to this office.
2. PCCF (FD & NO, FC Act), O/o the PCCF & HoFF, Odisha, Bhubaneswar with reference to Memo No. 7459 dated 25.09.2024 of the DFO, Angul Forest Division.
3. Regional Chief Conservator of Forests, Angul Circle along with copy of the approved SSWLCP with reference to his office Memo No.3746 dated 26.09.2024.
4. Divisional Forest Officer, Angul Forest Division along with copy of the approved SSWLCP with reference to Memo No. 3747 dated 26.09.2024 of the RCCF, Angul Circle.
5. Deputy Conservator of Forests (Administration), O/o. the PCCF(WL) & CWLW, Odisha. He is requested to raise demand to the User Agency for deposition of ₹161.8188 Lakh as contribution to the account of the society "The Wildlife Odisha".

01/10/2024

Chief Conservator of Forests (WL-III)

SUBHADRA OPEN CAST COAL MINE

(WEST OF GOPAL PRASAD WEST & UTKAL-A BLOCK)

Capacity: 25.0 MTPA

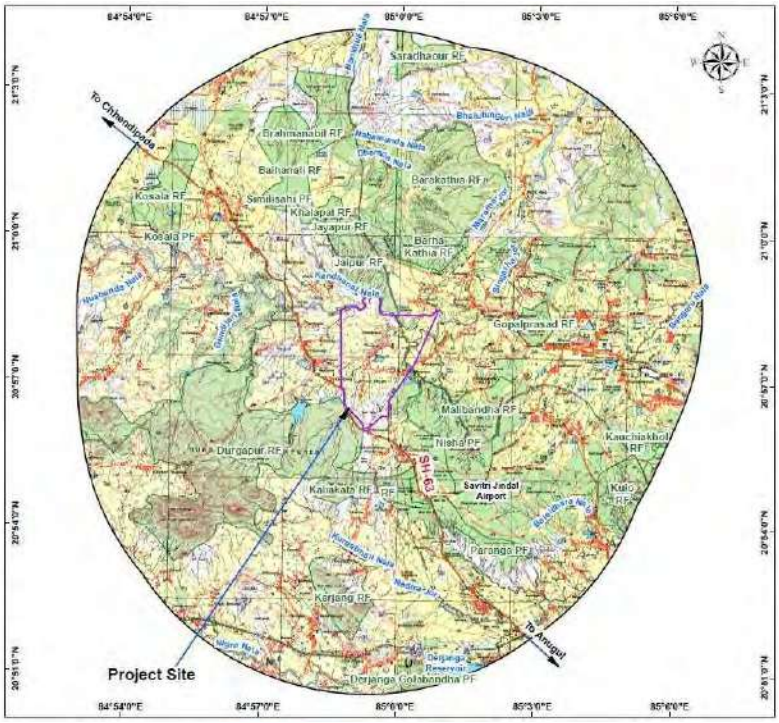
Area: 1111.85 Ha

In Talcher Coalfields (Mahanadi Coalfields Limited)

Angul Forest Division,

Angul district, Odisha

SITE-SPECIFIC WILDLIFE MANAGEMENT PLAN



Prepared by

Divisional Forest Officer,

Angul Forest Division

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

I Subhadra OCP Coal Block is located in Talcher Coalfield (Main Basin), Angul district of Odisha. It is situated between the latitudes of 20º 55'56.225" N and 20°58'47.344" N, and the longitudes of 84º 58'42.383" E and 85º 0'50.476" E. This coal block is encompassed within the Survey of India Topo Sheet No. F45S13 & F45T1, which is based on a scale of 1:50,000.

II The project encompasses a total area of 1111.85 hectares, with 125.24 hectares designated as forest land. The block's boundary is determined based on the provided following details:

North: Southern bank of Singhara Jhor and common boundary with Balabhadra & Balabhadra West Extn blocks.

South: Arbitrary lines and unblocked area.

East: Power line as well as common boundary with Gopal prasad East and Eastern part of Gopalprasad West block

West: Common boundary with Utkal-B1 and Utkal-C blocks and Angul-Chhendipada State Highway No-63.

III The important villages in and around the proposed coal block are Kankarei, Kaunsidhipa, Balichandrapur, Baghuabola, Pirakhaman, Chhotabereni, Golagadia, Kumundaand Raijharan villages located within the core zone of the study area and are adjacent to the project Site, while village Malibrahmani, Sanatribida & Kosala are located in the buffer zone of the Subhadra OCP.

IV The core zone of Subhadra OCP contains following Reserve Forest, Protected Forest, and Revenue Forest: -

Sr.No.	RF/PF	Area (Ha)
1.	Jaipur RF	0.75
2.	Kankarei Revenue Forest	46.98
3.	Pirakhaman Revenue Forest	4.09
4.	Balichandrapur Revenue Forest	2.21
5.	Raijharan Revenue Forest	13.99
6.	Kaunsidhipa Revenue Forest	20.30
7.	Golagadiya Revenue Forest	9.17
8.	Chhotabereni Revenue Forest	7.38
9.	Kumunda Revenue Forest	12.43
10.	Bhalugadia Revenue Forest	7.29

11.	Baghuabola Revenue Forest	0.65

Angul, the district headquarters, is situated on National Highway No.55, which connects Cuttack to Sambalpur. It is the closest town, approximately 22 km away, accessible via the Rengali-Chhendipada-Angul metalled road that runs along the southwestern boundary of the block. Additionally, the block is well-connected to Talcher town (around 36 km) and Talcher Railway station, which serves as the terminal station on the Talcher-Cuttack section of the East Coast Railways. The villages within this block are interconnected through mud roads and Morrum roads, facilitating accessibility within and between them. The block is located approximately 20 km away from the south-western boundary, where the nearest railhead, Angul, is situated. This railhead is connected to the Sambalpur-Bhubaneswar railway line of the East Coast Railways. Moving towards the east direction, about 240 km away, you will find the nearest port, Paradip, situated at the Bay of Bengal. If you are looking for the nearest airport, it is the Biju Pattanaik Airport, which is approximately 150 km away from the block in the south-east direction. This airport is located in the state capital, Bhubaneswar.

V The Singada Jhor river flows in an easterly direction and constitutes a significant portion of the northern boundary of the block. As it continues downstream, the Singada Jhor merges with the Brahmani River in the northeastern part of the coalfield. Within the block, the Sinhajori nala, Ghurudia nala, and Masani jhor flow from south to north, providing a constant water supply to the Singada Jhor and influencing the drainage pattern of the area. Additionally, there are numerous small ponds and dug wells in this block, which are commonly used for irrigation and drinking purposes.

VI The terrain of the area is characterized by gentle undulations, and the local residents primarily utilize the land for agricultural activities. In the southwestern region, the topography is slightly undulating and slopes in a northerly direction. Towards the southeastern corner of the block, the ground level gradually increases, reaching its highest point at approximately 160 meters above Mean Sea Level near borehole no. DMTU-106.

VII The core zone of this coal block comprises 9 villages, namely Kankarei, Kaunsidhipa, Balichandrapur, Baghuabola, Pirakhaman, Chhotabereni, Golagadia, Kumunda, and Raijharan. Additionally, the study area includes Malibrahmani, Sanatribida, and Kosala villages. Below is a summary of the demographic pattern observed in the study area:

Demographic profile of the study area

SR. NO.	PARAMETER	STUDYAREA
1.	No. of Villages	81
2.	Households	15975
3.	Household Ratio	4.1
4.	Total Population	66878
5.	Male Population (%)	34526(51.62%)
6.	Female Population (%)	32352(48.37%)
7.	Population (0-6 Years %)	8555(12.79%)
8.	Sex-Ratio	937
9.	Child Sex Ratio	895
10.	Scheduled Caste %	14683 (21.95%)
11.	Scheduled Tribes %	5639 (8.43%)
12.	Literates %	43362 (64.83%)
13.	Male Literates	25003 (57.66%)
14.	Female Literates	18359 (42.33%)
15.	Main Workers%	19211(28.72%)
• Cultivators (%)		6432 (33.48%)
• Agricultural Labourers (%)		3148 (16.38%)
• Household Labourers (%)		1120 (5.82%)
• Other Workers (%)		8511 (44.30%)
16.	Marginal Workers%	6569 (9.82%)
17.	Non-Workers %	41098 (61.45%)

*Source: *PCA Census 2011, Orissa State*

VIII The State's forest cover spans across an area of 52,155.95 km^2, accounting for 33.50% of its total geographic area. Among this, very dense forest covers 7,212.80 km^2, moderately dense forest covers 20,994.90 km^2, and open forest covers 23,948.25 km^2. Additionally, there is a scrub land area of 4923.70 km^2.

IX The current Working Plan of Angul forest division is effective from 2021-22 to 2030-31. As per the revised Forest Types (Champian and Seth 1968), the study area has been categorized as Orissa Semi Evergreen Forest (2B/C3), Moist Peninsular Low-Level Sal Forest (3C/C2e (ii)), Dry Peninsular Sal Forest (5B/C1c), and Dry Bamboo Brakes (5/E9). Within this Working Circle, Sal occurs either in its pure form or in combination with other tree species such as *Shorea robusta*, Saja (*Terminalia tomentosa*), Dhaora (*Anogesissus latifolia*), Bija (*Pterocarpus marsupium*), Sena (*Lagerstroemia parviflora*), Salia (*Boswellia serrata*), Tinsa (*Ougeinia oojeinensis*), Sagaun (*Tectona grandis*), Kari (*Saccopetalum tomentosum*), etc.

X The **flora** existing in the core and buffer zone are Sal (*Shorea robusta*), Teak (*Tectona grandis*), Haldu (*Adina cordifolia*), Dhaora (*Anogeissus latifolia*), Kardhai (*Anogeissus pendula*), Saliha (*Boswellia sserrata*), Char (*Buchnania lanzan*), Dhobin (*Dalbergia paniculata*), Tendu (*Dyospyros melanoxylon*), Amla (*Emblica officinalis*), Lendia(*Lagerstoremia parviflora*), Gunja (*Lannea coromandelica*), Mahua (*Madhuca indica*), Bija(*Pterocarpus marsupium*), Kusum (*Schleichera oleosa*), Bhelwa (*Semecarpus anacardium*), Jamun (*Syzygium cumini*), Harra (*Terminalia chebula*), Bahara (*Terminalia belerica*), Saja (*Terminalia tomentosa*) etc. **Grasses** noticed are *Aristida (Aristida funiculate), Chloris (Chloris barbata), Digitaria (Digitaria radicosa), Dimeria, (Dactyloctenium aegyptium), Setaria (Setaria glauca), Cenchrus (Cenchrus biflorus), Cyperus*etc. **Weeds** noticed are *Ageratum conyzoides, Alys icarous and Euphorbia sps.*

XI The observed fauna includes –

Mammals- Bison (Bos gaurus), Jackal (Canis aureus), Sambhar (Cervus unicolor), Short Nosed Fruit Bat (Cynopterus sphinx), Indian Elephant (Elephas maximus), Wild Cat (Felis chaus), Mongoose (Herpestres edwardsii), Striped Hyena (*Hyaena hyaena*), Indian Porcupine (*Hystrix indica*), Rhesus Macaque (*Macaca mulatta*), Common Otter (*Lutra lutra*), Indian Pangolin (*Manis crassicaudata*), Sloth Bear (*Melursus ursinus*), Kalarapartia Bagh (*Panthera pardus fusca*), etc.

Birds- Brown fish Owl (*Bubo zeylonensis)*, Blue Rock Pigeon (*Columba livia)*, Asian Koel (*Eudynamys scolopacea)*, Rufous Wood Pecker (*Micropternus brachyurus)*, Pied Kingfisher (*Ceryle rudis)*, Painted Partridge (*Gallop erdixlunulata)*, BengalVulture (*Galloperdix lunulata)*, Indian Great horned Owl (*Bubo bengalensis)*, Common Parakeet (*Psittacula eupatria)*, Grey Jungle Fowl (*Gallus sonneratti)*, Jungle Myna (*Acridothere stristis)*, Indian Cuckoo (*Cuculus micropterus)*, Indian Roller (*Coracias behghalensis)*, Spotted Dove (*Streptopelia chinensis)*, Bush Quail (*Perdicula asiatica)*, Chestnut bellied Sand Grouse (*Pterocies exustus)*, Peacock (*Pavo cristatus)*, Cattle Egret (*Bubulus ibis)*, Green Imperial Pigeon (*Ducula aenea)*.

Reptiles- Indian Rock Python (*Python morulus),* Garden Lizard (*Calotes versicolor)*, Rat Snake (*Ptyas mucosa)*, Indian Cobra (*Naja naja)*, King Cobra (*Ophiophagus hannah*),

Russel's Viper (*Vipera russelii*), Bengal Monitor Lizard (*Varanus bengalensis*), Checkered Keelback (*Xenochrophis piscator*).

Fishes- Katla (*Catla catla*), Mrigal (*Cirrhinus mrigala*), Rohu (*Labeo rohita*), Singi (*Heterophneustes*

Fossil), Balia (*Waalngonia attu*), Seula (*Ophiocaphalus striatus*), etc.

XII The potential negative impacts caused by this project include air pollution, noise pollution, occasional accidental death of wildlife, generation of litter, loss and degradation of habitats, forest fires, and fragmentation of wildlife habitats. To address these concerns, various mitigation measures have been implemented in the core area of the project, such as habitat improvement and protection, fire protection, awareness campaigns, and immunization of cattle along with awareness and capacity building for villagers. In the buffer area, mitigation measures include wildlife habitat improvement, fire protection measures, an anti-depredation squad, compassionate grants, and the creation of water holes.

XIII A monitoring committee will be established under the leadership of the Conservator of Forest Angul Circle, with the Divisional Forest Officer (DFO) of Angul Division serving as the Member Secretary. The committee will also include the Range Officers, Foresters, and Forest Guards of concerned forest area. Additionally, the village head of neighboring villages will attend the biannual meeting to thoroughly discuss the progress and impact of the plan's recommendations. Any changes or adjustments to the approved recommendations by the Principal Chief Conservator of Forests (Wildlife) will be implemented.

XIV The user agency, MCL, will submit an undertaking along with this Site-Specific Wildlife Management Plan, committing to provide the necessary funds and physical support to ensure the proper implementation of the points wise measures i.e. point no.1 to 6 mentioned in the Animal Passage Plan in and around the Subhadra OCP mining lease area in the future.

CHAPTER-1

INTRODUCTION

CHAPTER-1-INTRODUCTION AND METHODOLOGY

1.1 Introduction:

The mineral wealth of a nation is an important feature in its economic progress, and mining in India has a vital role in the development. Odisha has a glorious heritage in the field of natural resources, mines and minerals. The state is geologically so endowed that it has become a veritable repository of minerals.

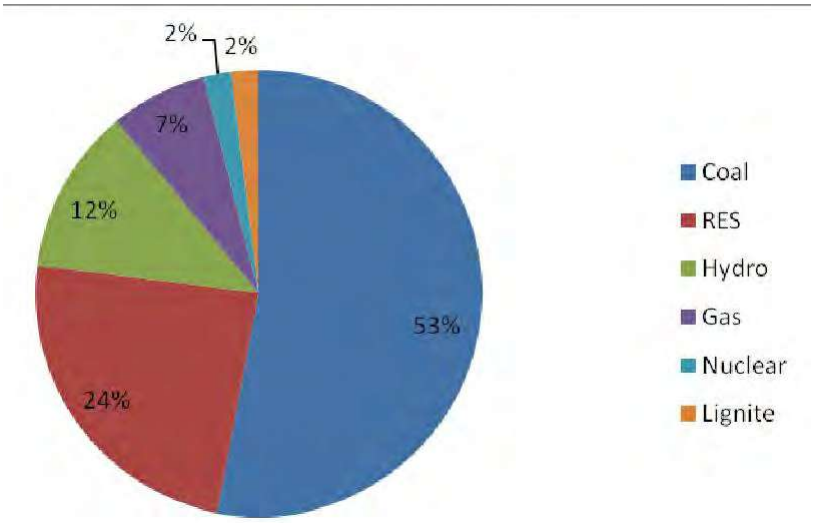
Electricity is the key factor for development of a nation. All sectors viz. industrial, agriculture and social require electric power for their growth and availability of electricity in the nation. Coal-based power plants are probably the most economically viable and time tested solution towards the solution of this problem. These thermal power plants obviously need constant supply of coal. Infact, about 67% of the power plants in India are coal based.

Coal Mining

Coal provides over 25 percent global primary energy need and 40 percent of the world's electricity consumption. It drives much of the global economic development. It is the main fuel for electricity generation in most of the countries in world. It is an essential element in over 65 percent of the world's steel production (World Coal Institute, 2006). It is the most abundant fuel resource in India. It is the prime source of energy and perhaps the largest contributor to the industrial growth of the country. Over the years, coal has become a major source of revenue in central India. Most of the rural consumers depend on coal for their energy needs. For consumers, coal offers excellent value, as it is cheaper per energy unit in comparison with other fuels.

The current per capita commercial primary energy consumption in India is about 350 kg/year-1. Considering the limited reserve potentiality of petroleum and natural gas, eco-conservation restriction on hydro electrical project and geo- political perception of nuclear power, coal will continue to occupy center- stage of India's energy scenario. No doubt coal plays a fundamental role in global development, but it must meet a number of social and environmental challenges to demonstrate its role in sustainable development.

Coal plays a crucial role in the production of electricity in India. As per the CEA data with regard to installed capacity in India (as of Oct'20), coal based installed capacity is about 53%, followed by Renewable Energy Sources (RES) at 24%, while hydro power (12%), gas (7%), nuclear (2%) and lignite (2%) round up the rest. The graph representing the fuel wise contribution to the country's installed power generation capacity is shown inthefigure1.1 below.



Source: https://powermin.nic.in/en/content/power-sector-glance-all-india

Figure1.1: Fuel-wise contribution in India installed power generation capacity

Mining is one of the major contributors towards the growth and sustenance of human civilization. In this context, coal mining has played a special role since ancient times; as coal is a major source of energy for the development of a society. However, coal mining has its own downside i.e., coal mines lead to degradation of land and especially for an opencast mine, where large tracts of land are used. During production of coal from mines and subsequent transportation of coal, significant pollution is generated. The pollution includes land degradation, air pollution, and water pollution, noise pollution, beside shaving impact on socio-economic status of the area and flora & fauna.

Coal deposits in Odisha

Coal deposits are mainly confined to eastern and south-central parts of the country. The states of Jharkhand, Odisha, Chhattisgarh, West Bengal, Andhra Pradesh, Maharashtra and Madhya Pradesh account for more than 99% of the total coal reserves in the country.

Odisha is one of the mineral rich states especially coal point of view. The state has about a quarter of the total coal reserves of the country. Though mining of minerals and extraction of metals were in practice in ancient Odisha. Modern mining as per available records started in 1909, when coal was first excavated in the Rampur area of IB valley. Over the years the mining activity has been accelerated to meet the demand of the public & private sector. Coal has been known as the alternative source of energy. In the year 1992 Mahanadi Coalfield Limited, a subsidiary of Coal India formed for Odisha. And after that all the mines those are coming under the Coal India subsidiaries in Odisha came under MCL. The IB Valley and Talcher coalfield are two main coal fields of Orissa where coal reserves and consequently coal mining activities are concentrated.

Talcher coalfield is having coal reserves of 40.87 billion (64.64%) tonnes and Ib Valley coalfield has 22.36 (33.36%) billion tonnes of coal reserves. Talcher coalfield is lying between latitudes 20^0 53' N and 20^0 12' N and longitude 84^0 24' E and 85^0 33' E. It is situated in Angul district of Orissa. It was first started at Gopalprasad in the year 1837. Since the sixties, there has been a steady increase in coal production from Talcher coalfield. Coal production was 0.91 Mt in 1972-73, the year of nationalization; the production became 13.80 Mt in the year 1991-92 just before the formation of MCL and 42.06 Mt in 2003- 04. The coal reserve of Mahanadi Coalfields Limited is spread over two Coalfields viz., Talcher and IB Valley with Ten (10) operating Areas consisting of Seven (7) underground and Sixteen (16) Open Cast Projects.

Rising demand for energy and coal as the primary energy source make it a significant resource in the country. Opening of Subhadra OCP coal, mine will have the following benefits:

- Increase supply of coal for India's power programme.
- Reduces power shortages hindering growth, foreign investment and productivity.

- Generate additional employment, both direct and indirect which will lead to economic growth of the industrial sector as well as country.
- This coal mining project will generate revenue Rs.47,700 crores in form of Govt Royalty, DMF, NEMT, GST & Social employment opeertunity in & around .
- Quality of life of local populace in villages shall improve due to company's community development programmes.

1.2 Location of Lease Area:

The Talcher coalfield is the largest repository of power grade coal in India. It occupies a basin in the south-eastern part of the Mahanadi Valley belt of Gondwana Basin and covers an area of about 1800 sq. kms and is located mainly in Angul district of Odisha. It is located between longitudes 20 degree 53 minute to 21 degrees 12-minute North and longitudes 84 degree to 85 degrees 23-minute East. The strike length of the coalfield in east-west direction is about 80kms and the width in north south direction is about 26Km.

The block lies between latitude 20º 55'56.225" N and 20° 58'47.344" N and longitude 84º 58'42.383" E and 85º 0'50.476" E and is covered under Survey of India topo sheet No. F45Z13 & F45T1 on RF 1: 50,000. The boundary of the block is defined as per the following details:

North: Southern bank of Singhara Jhor and common boundary with Balabhadra & Balabhadra West Extn blocks.

South: Arbitrary lines and unblocked area

East: Power line as well as common boundary with Gopalprasad East and Eastern part of Gopal prasad West block

West: Common boundary with Utkal-B1 and Utkal-C blocks and Angul-Chhendipada State Highway No-63.

Utkal-A and West of Gopalprasad West block covers an area of 11.45 sq. km. The block is nearly triangular in shape having about 5.2 km length in north-south direction and about maximum 3.6 km width in east-west direction.

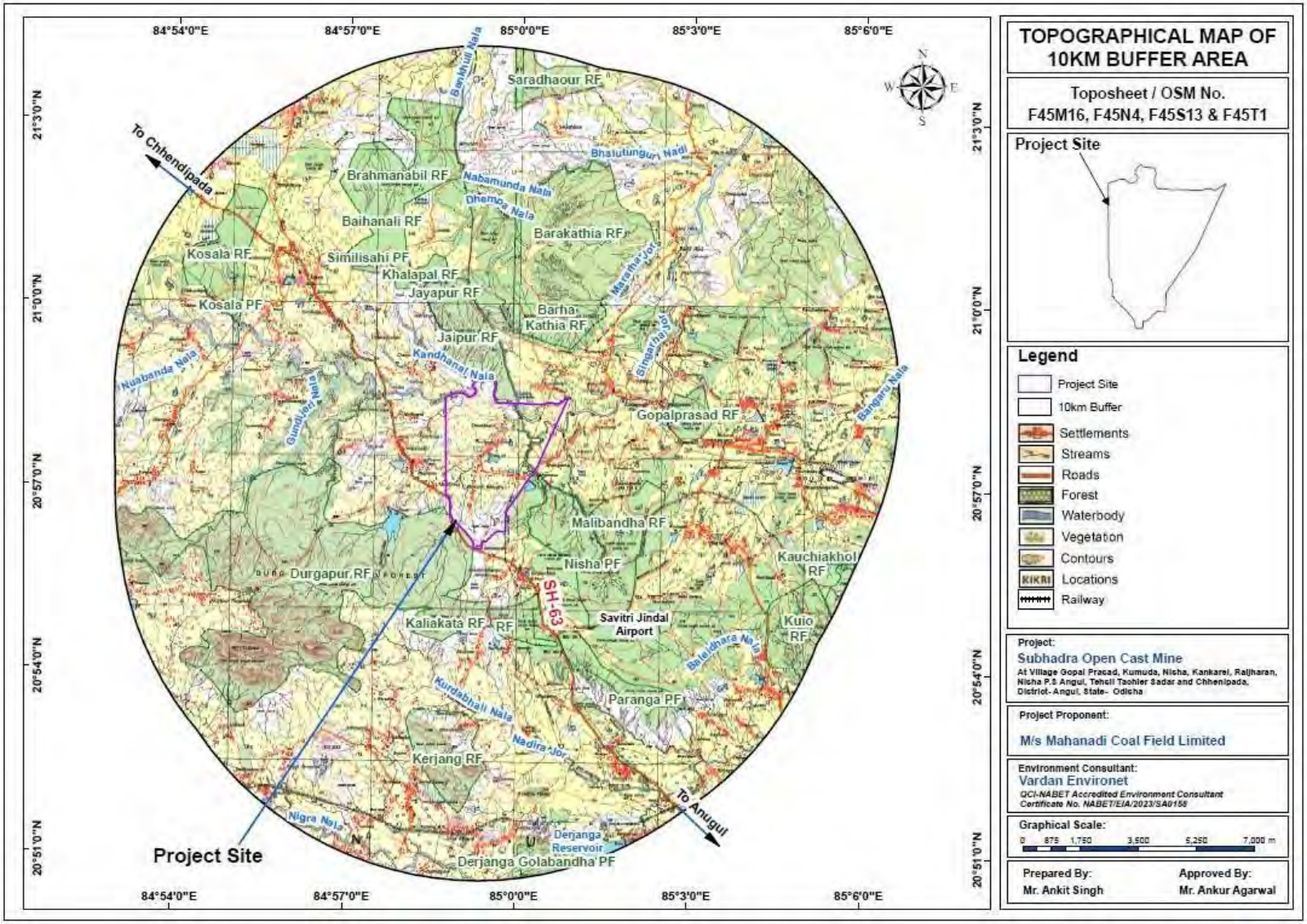


Figure-1.2:10 km Study area around Subhadra OCP

CHAPTER-2

PROJECT AND IMPACT AREA

CHAPTER-2-PROJECT AND IMPACT AREA

2.1 PROJECT AREA

The proposed project covers an area of 1111.85 Ha. The block is nearly triangular in shape having about 5.2 km length in north-south direction and about maximum 3.6 km width in east-west direction.

The block lies between latitude 20º55'56.225" N and 20°58'47.344" N and longitude 84º58'42.383" E and 85º0'50.476" E and is coavered under Survey of India toposheet No. F45S13 & F45T1 on RF 1: 50,000. The boundary of the block is defined as per the following table:

Table-2.1: Boundaries of the Block

North	Southern bank of Singhada Jhor including proposed diversion.
South	Arbitrary lines and unblocked area
East	Power line as well as common boundary with 'Gopal Prasad East and Eastern part of Gopalprasad West block'
West	Common boundary with Utkal-B1 and Utkal-C block.

Table-2.2: Location Details

Coalfield	Talcher Coalfield
Area	Subhadra Area
Tehsil	Talcher and Chhendipada
District	Angul
Latitudes & Longitudes	A-20°56'31.89"N 84°58'48.26"E B-20°56'51.92"N 84°58'44.54"E C-20°58'27.97"N 84°58'42.33"E D-20°58'32.54"N 84°59'0.97"E E-20°58'28.73"N 84°59'5.77"E F-20°58'39.68"N 84°59'11.16"E G-20°58'48.30"N 84°59'19.19"E H-20°58'37.15"N 84°59'34.55"E I-20°58'23.31"N 84°59'37.48"E

	J-20°58'28.96"N 85°0'50.90"E K-20°56'36.65"N 84°59'47.38"E L-20°56'16.66"N 84°59'46.69"E M-20°56'6.82"N 84°59'22.44"E N-20°55'58.93"N 84°59'18.24"E
Toposheet No.	F45S13 &F45T1 on RF1:50,000

2.2 Forest Jurisdiction:

The administrative jurisdiction of proposed Subhadra OCP comes under Angul Forest Division. Out of the lease hold area of 1111.85 ha only125.24 ha is forestland.

Table-2.3: Lease Hold Area

Type of Land	**Area (ha)**
Forest Land	125.24
Non-Forest Land	986.61
Total	**1111.85**

2.3 Land Use Pattern:

The project area comprises of total 1111.85 ha, out of which, 125.24 ha Land is forest land, 696.50 ha is tenancy land and 290.11 ha area is Non-Forest Govt. land. The existing land utilizationin the project area is given in **Table 2.4**.

Table-2.4: Land Use Pattern of Subhadra OCP

Land Type		**Area(Ha)**
Tenancy	Agricultural	661.70
	Township	0.00
	Grazing	0.00
	Barren	0.00
	Water Bodies	6.28
	Road	0.25
	Community/Other use	28.27
Non-Forest Govt.	Agricultural	138.80
	Township	0.00
	Grazing	58.67
	Barren/Other use	92.64

Forest	Reserve Forest	0.75
	Protected Forest	0.00
	Revenue Forest	124.49
Total Area		**1111.85**

Table-2.5: Mining Land Use Details

Type	Land Use Proposed	Land Use(End of Life)	Land Use (PostClosure)						
			Agriculture Land	Plantation	Water Body	Public/Company Use	Forest Land (Returned)	Unplanted	Total
Excavation Area	881.28	881.28							
Backfilled Area	715.24	715.24	495.27	182.52			37.45		715.24
Excavation void without plantation	130.68	130.68						130.68	130.68
Water harvesting	35.36	35.36			35.36				35.36
Top Soil Dump	8.97	8.97	8.97						8.97
Coal Stock Yard	9.76	9.76	9.76						9.76
External dump	24.17	24.17	24.17						24.17
Safety Zone	11.79	11.79		11.79					11.79
Haul road between quarries	0.00	0.00							0.00
Nala Diversion & Settling pond	8.42	8.42				8.42			8.42
Road, building & Infrastructure	Road: 15.72	Road: 15.72				15.72			118.16
	Township: 27.12	Township: 27.12		1.26		25.86			
	Infra: 75.32	Infra: 75.32					75.32		
	118.16	118.16							
Rationalization area	25.34	25.34		25.34					25.34
Embankment	11.49	11.49				11.49			11.49
Greenbelt	6.89	6.89					6.89		6.89
Explosive magazine	5.58	5.58					5.58		5.58
Total	1111.85	1111.85	538.17	220.91	35.36	61.49	125.24	130.68	1111.85

2.4 Demographic Pattern:

Demographic structure of the study area was estimated for the selected parameters as households, population, sex ratio, scheduled caste, scheduled tribes, literacy from primary census abstract, CD 2011 of Odisha State. Total number of households in the study area is about 15975 with total population is about 66878 with male population is 34526 (51.62%) and female population is 32352 (48.37%). Summary of demographic profile of the study area is given in **Table 2.6**. Demographic andOccupational Structure of the study is given in **Table 2.7 and 2.8** respectively.

Table-2.6: Demographic profile of the study area

SR.NO.	PARAMETER	STUDYAREA
1.	No. of Villages	81
2.	Households	15975
3.	Household Ratio	4.1
4.	Total Population	66878
5.	Male Population (%)	34526(51.62%)
6.	Female Population (%)	32352(48.37%)
7.	Population (0-6Years%)	8555(12.79%)
8.	Sex Ratio	937
9.	Child Sex Ratio	895
10.	Scheduled Caste %	14683(21.95%)
11.	Scheduled Tribes %	5639(8.43%)
12.	Literates %	43362(64.83%)
13.	Male Literates	25003(57.66%)
14.	Female Literates	18359(42.33%)
15.	Main Workers%	19211(28.72%)
• Cultivators (%)		6432(33.48%)
• Agricultural Labourers (%)		3148(16.38%)
• Household Labourers (%)		1120(5.82%)
• Other Workers (%)		8511(44.30%)
16.	Marginal Workers %	6569(9.82%)
17.	Non-Workers %	41098(61.45%)

Table-2.7: Details of village-wise demographic pattern

Sr.No.	Villages	Households	Total Population	Male Population	Female Population	Population(0-6Years)	Scheduled Caste	Scheduled Tribes	Literates
Odisha State									
Angul District									
Chhendipada Tahasil									
1	Kaunsidhipa	37	167	89	78	21	0	0	98
2	Chhotabereni	89	339	176	163	44	229	9	235
3	Kankarei	525	1799	913	886	223	154	115	1214
4	Balichandrapur	63	278	140	138	27	34	10	187
5	Pirakhaman	114	390	204	186	52	0	92	217
6	Raijharan	804	3151	1591	1560	553	1247	359	1836
7	Ambapal	354	1691	877	814	203	505	0	1083
8	Ambapaljungle	0	0	0	0	0	0	0	0
9	Natada	641	2899	1536	1363	344	397	299	1992
Total		**2627**	**10714**	**5526**	**5188**	**1467**	**2566**	**884**	**6862**
Talcher Tahasil									
1	Kumunda	466	1838	966	872	197	260	6	1354
2	Bhalugadia	199	797	416	381	98	203	0	563
3	Baghuabol	0	0	0	0	0	0	0	0
Total		**665**	**2635**	**1382**	**1253**	**295**	**463**	**6**	**1917**
Grand Total		**3292**	**13349**	**6908**	**6441**	**1762**	**3029**	**890**	**8779**

Table-2.8: Occupational Structure of the Study Area (RURAL)

Sr.No.	Villages	Total Main Workers	Main Workers				Marginal Workers	Non-Workers
			Cultivators	Agricultural Laborers	Household Laborers	Other Workers		
Odisha State								
Angul District								
Chhendipada Tahasil								
1	Kaunsidhipa	46	27	3	1	15	3	118
2	Chhotabereni	85	9	61	0	15	17	237
3	Kankarei	490	295	108	4	83	8	1301
4	Balichandrapur	52	30	18	0	4	104	122
5	Pirakhaman	101	65	25	0	11	0	289
6	Raijharan	1201	459	443	122	177	338	1612
7	Ambapal	528	76	33	4	415	17	1146
8	Ambapaljungle	0	0	0	0	0	0	0
9	Natada	847	255	44	6	542	128	1924
Total		**3350**	**1216**	**735**	**137**	**1262**	**615**	**6749**
Talcher Tahasil								
1	Kumunda	809	174	359	4	272	12	1017
2	Bhalugadia	198	101	5	3	89	116	483
3	Baghuabol	0	0	0	0	0	0	0
Total		**1007**	**275**	**364**	**7**	**361**	**128**	**1500**
Grand Total		**4357**	**1491**	**1099**	**144**	**1623**	**743**	**8249**

2.5 Cropping Pattern:

Two seasonal crops mainly Kharif (summer crop) and Rabi (winter crop) are well developed in this region. The crops grown are Paddy, Jawar, Maize and Kodo. Mustard and Til are also grown along with the pulses like Arhar, Mung etc. The main Kharif crop is also paddy which is cultivated with a short rotation and this type of crop is grown only where irrigation facilities are available during winter. In addition, Alsi, Mustard, etc. are also grown during Rabi. A very significant matter is use of fertilizers and pesticides in this region are very much limited as most of the agricultural practitioners are traditional and support use of green manure.

2.6 Extent of Biotic Pressure on the study area:

At present agriculture is not imposing any biotic pressure on the natural ecosystem particularly of this region. The population growth is a common phenomenon all over which is not restricted to only the study area. The population growth has its impact on the natural ecosystem, common to everywhere. The energy consumption by the villagers for cooking food items entirely depends on adjoining forest areas i.e. Collection of fuelwood.

2.7 Non-timber Forest Produces (NTFPs) Collection:

Tropical forests, known as the most biodiverse regions on Earth, are home to a plethora of medicinal and economically valuable plants. Unfortunately, the excessive exploitation of these forests has led to a rapid decline, making it a significant global concern in terms of both the environment and the economy (Hareetal.1997). Sacred groves, also referred to as "Debasthali" or "Saktipitha," are small patches of pristine vegetation that have been preserved by local communities as part of their socio-cultural and religious practices. These groves not only support diverse ecosystems but also contribute to the sustainable livelihoods of indigenous communities and serve as a reservoir of genetic diversity.

The majority of families residing in the impact area are from the SC and ST communities, who are actively engaged in the collection of NTFPs. They have been utilizing the forest area for open grazing and other customary practices. Additionally, the villagers gather leaves from fodder species by cutting branches. Another common practice among the villagers is to obtain NTFPs such as Amla, Bahada, Harida, Bela, Kendu, Kusum, etc. with minimal labor but higher yield by either lopping the branches or even felling the entire tree for a few fruits. It is imperative to put an end to these practices. Therefore, it is

recommended that the forest fringe villagers and members of the VSS undergo training on non-destructive methods of collecting NTFPs. They should also be educated on the latest techniques for sustainable NTFPs collection.

The Angul division's forests are home to a wide range of species that produce various non-timber forest products (NTFPs) such as fruits, seeds, tubers, barks, leaves, roots, and gums. These NTFPs can meet the needs of many people without depleting the resource. Rural households, in particular, rely on NTFPs for essential food and nutrition, medicine, fodder, fuel, thatch, construction materials, mulch, and non-farm incomes. These products play a crucial role in helping communities cope with periods of food scarcity during the agricultural cycle and in mitigating other seasonal fluctuations. The people living in and around the forests depend on NTFPs as a vital component of their livelihood security. They gather these products for personal consumption and also sell them to supplement their earnings. For the rural population, especially those living on the outskirts of the forest, collecting and marketing NTFPs can provide employment during lean periods of the agricultural cycle and serve as a safety net against risks and household emergencies.

In recent years, there has been a significant increase in the demand for various types of Non-Timber Forest Products (NTFPs) as raw materials in industries such as herbal cosmetics, dyes, and ayurvedic drugs. This surge in demand has resulted in a booming global trade of these herbal materials, estimated to be worth over 60 billion dollars annually. However, this high demand for a limited number of NTFP varieties has led to destructive exploitation, particularly of already scarce and endangered species. Collectors often employ methods that are extremely damaging, posing a serious threat to species that have underground propagative parts like rhizomes, bulbs, and tubers. As a result, these species face the risk of extinction. Even once abundant species like Amla (Emblica officinalis) and Char (Buchnania lanzan) are now under threat due to over-exploitation. Middle-aged trees, which are crucial for the growth of these species, are being indiscriminately cut down to harvest unripe fruits before they naturally fall. This practice not only hampers the regeneration of the species but also affects the genetic composition and quality of the resource, especially if only inferior fruits and seeds are left for regeneration. Furthermore, the greed of local communities, middlemen, and end users further complicates the situation. If this unsustainable and excessive exploitation continues, it will ultimately endanger the very existence of these resources. Overexploitation is

exacerbated by factors such as excessive grazing, illegal tree felling, frequent forest fires, and the invasion of weeds, which often result in the loss of natural regeneration of these species in the forest.

The forest plays a crucial role in meeting the diverse needs of people. The rural community relies on the forest for bamboo, poles, fuel wood, and timber, which are essential for agricultural implements, house construction, bullock carts, and fencing. Additionally, the forest provides various non-timber forest products (NTFP) such as seeds, leaves, flowers, roots, and bark. These NTFP items are obtained from the forest and are important sources of food, particularly for tribal and rural poor communities. It is reported that 60% of non-timber forest produce is consumed as food or dietary supplements by forest dwellers. Furthermore, approximately 75% of forest-dependent individuals supplement their food intake throughout the year with tubers, flowers, leaves, and fruits. In rural areas, the main species used for timber include Sal, Bandhan, Teak, Kurum, Asan, and for poles, Arjun, Kendu, Sidha, Karada, Dhaura, and others.

2.8 Topography& Drainage:

The surface of the area has a gentle undulating topography, with the highest point located in the southwest at an elevation of 167.50m above mean sea level (AMSL), and the lowest point in the northeast at an elevation of 107.50m AMSL. The average gradient of the surface is 1:120. The drainage of the coal field is directed towards the Brahmani River, which is located 20km east of the block. Within the block, the drainage flows into the Singhada Jhor perennial stream at the northern boundary, which eventually feeds into the Brahmani River. Additionally, there is a seasonal stream called Ghurudia that traverses across the block. The mean annual precipitation in the area is 1277mm, with 70% of it occurring during the rainy season.

HFL has been estimated based on actual measurements taken at two locations: one situated 2.1km upstream and the other 2.2km downstream. The Brahmani River, which runs approximately 20km from the mine boundary in the north along the eastern boundary of the Talcher coalfield, serves as the primary drainage system for the area. This river is replenished by seasonal nalas, namely Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor, and a few smaller nalas. Singada Jhor flows towards the east and forms a significant portion of the northern boundary of the block. It eventually merges with the Brahmani

River downstream, in the northeastern part of the coalfield. Within this block, there are several small ponds and dug wells that are commonly used for irrigation and drinking purposes.

2.9 Natural Drainage Lines:

The region is drained by the Brahmani River, which runs approximately 20 km away from the northern to southern boundary along the eastern boundary of the Talcher coalfield. This river is primarily supplied by seasonal nalas, namely Tikra Jhor, Singada Jhor, Bangaru Jhor, Nandira Jhor, and a few smaller nalas. Moving eastward from the block's eastern boundary, the Brahmani river is situated at a distance of around 20 km. Singada Jhor dominates the drainage pattern of the block for most of the year. Additionally, small ponds and dug wells are commonly found in this area and serve purposes such as irrigation and drinking water supply.

2.10 Climate:

The region experiences a warm sub-tropical climate with an average annual precipitation of 1277mm. The majority of rainfall, about 70%, occurs during the rainy season. The mean temperature ranges from 6.70C to 45.50C. At the Angul Meteorological (IMD) station, the annual average wind speed recorded in 2019 was 2.5kmph. However, the monthly mean wind speed varies throughout the year, ranging from 1.8kmph in October to 3.4kmph in June. For different seasons, the prevailing wind directions in this area are as follows: SW for monsoon, NW & NE for post-monsoon, NW, NE & SE for winter, and NW, SE, NE & SW for pre-monsoon cyclone seasons. The average relative humidity in the region fluctuates between 25% in March or April and 82% in August.

2.11 Description of Flora and Fauna:

The distribution pattern of natural species of flora and fauna in an ecosystem reflects changes in the composition of biotic communities. This sensitivity of animal and plant species to changes in their environment can be utilized for monitoring the Impact Assessment studies of any project. The biological communities serve as indicators of the environmental condition and the availability of resources for their distribution and survival. These communities consist of both plant (flora) and animal (fauna) species, which interact not only with each other but also with the physical and chemical components of the

environment. The changes in the biotic community are studied by examining the distribution, abundance, and diversity of species.

2.11.1 Methodology for Biodiversity Assessment:

I. Floral Diversity:

The present study on the floral assessment for the project activity is based on field survey of the area. Inventory methodology was adapted to the baseline data of floral diversity in a corridor of 10km radius from the project site of the proposed project using the relevant toposheets of scale1:50000.

A forest inventory is **"an attempt to describe the quantity and quality of forest trees and many of the characteristics of the land area upon which the trees are grown."** The objective this floral inventory of the study area, is to provide complete checklist of flora along with the entire stretch of the proposed project for formulating effective management and conservation measures. The tree species, shrubs, herbs and climbers observed in the study area (Core zone, Buffer Zone and Protected Areas NP/WLS/PF/RF) are represented in the **Table 2.9.**

II. Faunal Diversity:

A linear transect of 1.0 km each was chosen for sampling at each site. Each transects was trekked for 1.5 hr for the sampling of faunal diversity through following methods for different categories. For the sampling of butterflies, the standard 'Pollard Walk' method was employed and all the species recorded daily. Voucher specimens of the species that could not be identified in the field were collected using a butterfly net besides photographing them.

For bird's sampling, 'Point Sampling' along the fixed transect (Foot trails) was carried out. All the species of birds were observed through a binocular and identified with the help of field guide book and photographs.

For the sampling of mammals, direct count on open width (20m) transect was used. In addition, information on recent sightings/records of mammals by the villagers/locals was also collected. For carnivores, indirect sampling was carried out and the mammals were identified by foot marks, faeces and other marks/sign created by them. In case of reptiles mainly lizards were sampled by direct count on open width transects.

The study of fauna takes substantial amount of time to understand the specific faunal characteristic of area. The assessment of fauna has been done by extensive field survey of

the area. During survey, the presence of wildlife was also inhabitants depending on animal sightings and the frequency of their visits in the project area which was later confirmed from forest department, wildlife departments, etc.

III. Aquatic Diversity:

a) Zooplankton:

For zooplankton analysis, 20L of subsurface water was strained through 53µ Nytex plankton net and the concentrate was transferred to labeled plankton bottle after rinsing the net with distilled water. The planktons were immediately preserved in 4% neutral formaldehyde solution for subsequent examination and quantification.

Zooplanktons samples were observed in a sedimentation chamber under an inverted plankton microscope. Planktons were identified with the help of standard keys and references.

b) Phytoplankton:

Similarly, for phytoplankton analysis, water sample were taken directly from the sites in 100 ml sampling bottles and preserved with Lugol's solution immediately. Then the samples were centrifuged in the laboratory followed by removal of desired amount of supernatant from the centrifuge tube to make the required concentration.

c) Fishes:

Fisheries data has been collected through consultation with local fishermen and throwing nets.

2.11.2 Forest Types of Study Area:

Odisha state is situated in the eastern part of the country and has a geographic area of 1,55,707 km^2, which constitutes 4.74% area of the country. Odisha is bound on the east by the 450 km coastline of the Bay of Bengal and is surrounded by Andhra Pradesh on the South-West, Chhattisgarh on the west and Jharkhand in the north, West Bengal in the north-east and Bay of Bengal in the east. Physiographically, the State can be divided into four regions, North Plateau, Eastern Ghats, Central Tableland and Coastal Plains. The State is drained by three major rivers, Mahanadi, Brahmani and Baitarni. The State is rich in mineral resources including coal, iron, bauxite, chromite and nickel.

The State's forest cover spans across an area of 52,155.95 km^2, accounting for 33.50% of its total geographic area. Among this, very dense forest covers 7,212.80 km^2, moderately dense forest

covers 20,994.90 km^2, and open forest covers 23,948.25 km^2. Additionally, there is a scrub land area of 4923.70 km^2. (ISFR-2021)

Tropical dry deciduous forests cover the maximum forest cover in the state followed by tropical moist deciduous forests. According to revised Forest Types (Champion & Seth,1968) the forest type of the lease area along with the 10 km Radius buffer area, confirms to following forest types: -

i. Dry Peninsular Sal Forest (5B/C1c)
ii. Northern Dry Mixed Deciduous Forest (5B/C2)
iii. Dry Bamboo Brakes (5/E9)

i. Dry Peninsular Sal Forest (5B/C1c): The characteristic species of this forest type are *Shorea robusta, Anogeissus latifolia, Woodfordia fruticosa, Buchanania lanzan, Madhuca indica, Diospyros tomentosa* etc. The soil is dry and shallow with less undergrowth and climbers compared to moist area. *Pterocarpus marsupium* is less in this forest type.

ii. Northern Dry Mixed Deciduous Forest (5B/C2): The characteristic species of this type are *Anogeissus latifolia, Cleistanthus collinus, Nyctanthes arbortristis, Lannea coromandelina. Mallotus philippensis* etc. Rainfall ranges from 900 to 1150 mm. Dry soil condition is generally observed and undergrowth is scanty.

iii. Dry Bamboo Brakes (5/E9): Bamboo grows in dense patches with some thorny species.

2.11.2 Biodiversity within the Core Zone:

2.11.2.1 Flora:

M/s Mahanadi Coalfields Limited has been allocated the core zone, known as Subhadra OCP area, in Talcher Coalfield, Odisha by the Ministry of Coal, Government of India. This lease is situated in the Talcher Coalfields (Main Basin), specifically in Tehsil: Talcher, Angul district of Odisha. For more information on the floral diversity of the Subhadra OCP (core zone), please refer to **Table-2.9**.

Table-2.9: Floral Diversity within Core Zone

Sr.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
TREES					
1	Acacia auriculoformis	Babul	Fabaceae	Tree	LC
2	Acacia leucophloea	Gohira	Fabaceae	Tree	NA
3	Acacia nilotica	Bandhana	Fabaceae	Tree	NA
4	Aegle marmelos	Bela	Rutaceae	Tree	NT
5	Alangium lamarckii	Ankula	Cornaceae	Tree	NA
6	Albizia lebbeck	Kala Sirisa	Fabaceae	Tree	LC
7	Albizia procera	Dhala Sirisa	Fabaceae	Tree	LC
8	Artocarpus heterophyllus	Panasa	Moraceae	Tree	NA
9	Artocarpus lakoocha	Jeotha	Moraceae	Tree	NA
10	Azadirachta indica	Neem	Rutaceae	Tree	LC
11	Bauhinia purpurea	kanchan	Caesalpiniaceae	Tree	NA
12	Bauhinia racemosa	Ambta	Caesalpiniaceae	Tree	NA
13	Bombax ceiba	Simili	Malvaceae	Tree	LC
14	Boswellia serrata	Salai	Burseraceae	Tree	NA
15	Buchanania lanzan	Chara	Anacardiaceae	Tree	NA
16	Butea monosperma	Palasa	Fabaceae	Tree	NA
17	Careya arborea	kumbhi	Lecythidaceae	Tree	NA
18	Cassia fistula	Sunari	Caesalpiniaceae	Tree	LC
19	Dalbergia latifolia	Shisoo	Fabaceae	Tree	VU
20	Dillenia indica	Oau	Dilleniaceae	Tree	LC
21	Dilleni apentagyna	Rai	Dilleniaceae	Tree	NA
22	Diospyros embryopteris	Mankadakendu	Ebenaceae	Tree	NA
23	Diospyros montana	Hinjala	Ebenaceae	Tree	NA
24	Ficus benghalensis	Bara	Moraceae	Tree	NA
25	Ficus glaberrina	Kharsan	Maoraceae	Tree	NA

Sr.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
26	Ficus religiosa	Aswatha	Moraceae	Tree	NA
27	Flacourtia indica	Bhaincha	Salicaceae	Tree	LC
28	Gardenia gummifera	Kaapar	Rubiaceae	Tree	LC
29	Gardenia latifolia	Damkurudu	Rubiaceae	Tree	NA
30	Grewia tiliifolia	Dhaman	Tiliaceae	Tree	NA
31	Holoptelea integrifolia	Dhaurang	Ulmaceae	Tree	NA
32	Kydia calycina	Kapasia	Malvaceae	Tree	NA
33	Lagerstroemia parviflora	Sidha	Lythraceae	Tree	NA
34	Madhuca indica	Mahula	Sapotaceae	Tree	NA
35	Mallotus philippensis	Gundi	Euphorbiaceae	Tree	NA
36	Mangifera indica	Amba	Anacardiaceae	Tree	NA
37	Polyalthia longifolia	Debadaru	Annonaceae	Small	NA
38	Pongamia glabra	Karanja	Fabaceae	Tree	NA
39	Pterocarpus marsupium	Bijasal	Fabaceae	Tree	NT
40	Schleichera oleosa	Kusuma	Sapindaceae	Tree	LC
41	Semecarpus anacardium	Bhalia	Anacardiaceae	Tree	LC
42	Shorea robusta	Sal	Dipterocarpaceae	Tree	LC
43	Sterculia urens	Girdhini / Genduli	Sterculiaceae	Tree	NA
44	Sterculia villosa	Kodala	Sterculiaceae	Tree	NA
45	Strychnos nux-vomica	Kochila	Loganiaceae	Tree	NA
46	Syzygium cumini	Jamun	Myrtaceae	Tree	NC
47	Tamarindus indica	Tentuli	Caesalpiniaceae	Tree	LC
48	Tectona grandis	Sagaun	Verbenaceae	Tree	EN
49	Terminalia arjuna	Arjuna	Combretaceae	Tree	LC
50	Terminalia bellirica	Bahada	Combretaceae	Tree	LC
51	Terminalia chebula	Harida	Combretaceae	Tree	LC
SHRUBS					
1	Adhatoda vasica	Basanga	Acanthaceae	Shrub	LC
2	Antidesma diandrum	Mamari	Phyllanthaceae	Shrub	NA
3	Atalantia monophylla	Narguni	Rutaceae	Shrub	NA
4	Calamus guruba	Beta	Arecaceae	Shrub	NA
5	Calotropis gigantea	Arakha	Asclepiadaceae	Shrub	NA
6	Carissa spinarum	AnkaKoli	Apocynaceae	Shrub	LC
7	Eupatorium odoratum	Pokasungha	Asteraceae	Shrub	G5
8	Euphorbia royleana	Siju	Euphorbiaceae	Shrub	NA
9	Flemingia chappar	Ranidantakathi	Fabaceae	Shrub	NA
10	Helicteres isora	Mura	Sterculiaceae	Shrub	NA
11	Lantana camara	Nagairy	Verbenaceae	Shrub	G5

Sr.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
12	Mimosa pudica	Lajakoli	Fabaceae	Shrub	LC
13	Nyctanthes arbortristis	Gangasiuli	Oleaceae	Shrub	LC
14	Phyllanthus reticulatus	Panjoli	Euphorbiaceae	Shrub	NA
15	Ricinus communis	Rendi	Euphorbiaceae	Shrub	NA
16	Woodfordia fruticosa	Dhatki	Lythraceae	Shrub	LC
17	Ziziphus oenoplia	Kantaikoli	Rhamnaceae	Shrub	NA
HERBS					
1	Aerva lanata	Gorakhganja	Amaranthaceae	Herb	NA
2	Andrographis paniculata	BhuinNima	Acanthaceae	Herb	NA
3	Argemone mexicana	Swarnchhiri	Papaveraceae	Herb	NA
4	Boerhavia diffusa.	Raktpunarwa	Nyctaginaceae	Herb	NA
5	Bulbostylis barbata		Cyperaceae	Sedges	NA
6	Cassia tora	Chakundi	Caesalpiniaceae	Herb	NA
7	Catharanthus roseus	Sadabahar	Apocynaceae	Herb	NA
8	Commelina benghalensis	Kanchara	Commelinaceae	Herb	NA
9	Crotalaria prostrate	KartikJhumka	Fabaceae	Herb	NA
10	Cyperus rotundus	Motha	Cyperaceae	Sedges	LC
11	Daturas tramonium	Dudura	Solanaceae	herb	NA
12	Desmodium cephalotes	Ranidanturi	Fabaceae	Herb	NA
13	Euphorbia hirta	Doodhi	Euphorbiaceae	Herb	NA
14	Evolvulus alsinoides	Sakhpushpi	Convolvulaceae	Herb	NA
15	Fimbristylis dipsacea	NA	Cyperaceae	Sedges	NA
16	Fimbristylis falcata	HathiPaw	Cyperaceae	Sedges	NA
17	Fumaria indica	Pitpapra	Papaveraceae	Herb	NA
18	Heliotropium indicum	Hastimundi	Boraginaceae	Herb	LC
19	Ipomoe aeriocarpa	Besharam	Convonvulaceae	Herb	NA
20	Justiciaquinque angularis	Justicia	Acanthaceae	Herb	NA
21	Leucas aspera	Bhondaki	Lamiaceae	Herb	NA
22	Melilotus indica	Van Maithi	Fabaceae	herb	NA
23	Ocimum basilicum	BanTulsi	Lamiaceae	Herb	NA
24	Oxalis corniculata	Teenpati	Oxalidaceae	Herb	NA
25	Phyllanthus niruri	BhuinAnala	Euphorbiaceae	Herb	NA
26	Polygonum barbatum	Polygonum	Polygonaceae	Herb	NA
27	Polygonum glabrum	Polygonum		Herb	NA
28	Rauvolfia serpentina	Sarpandha	Apocynaceae	Herb	CITES Appendix II
29	Rungia pectinata	Rungia	Acanthaceae	Herb	NA
30	Sida cordifolia	Kharenti	Malvaceae	Herb	NA
31	Sida rhombifolia	Atibala	Malvaceae	Herb	NA

Sr.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
32	Solanum nigrum	makoya	Solanaceae	Herb	NA
33	Solanum virginianum	Katai	Solanaceae	Herb	NA
34	Tridax procumbens	KhalMuriya	Asteraceae	Herb	NA
35	Triumfetta rhomboidea	Chipki	Tiliaceae	Herb	NA
36	Xanthium strumarium	Gokharu	Asteraceae	Herb	NA
37	Gloriosa superba	Agnisikha	Colchicaceae	Herb	NA
GRASSES & BAMBOO					
1	Aristida adscensionis.	Aristida	Poaceae	Grasses	NA
2	Dendrocalamus strictus	Salia``Baunsa	Poaceae	Grasses	NA
3	Bothriochlo apertusa	Bothricloa	Poaceae	Grasses	NA
4	Cenchru sciliaris	Cenchurus	Poaceae	Grasses	LC

(Source: Primary Survey Data)

2.11.2.2 Fauna:

The presence of various animal species in a specific area can provide valuable insights into the environmental conditions and the overall welfare of the population residing there. Studying the fauna helps us understand the state of natural systems and provides indications of how the ecosystem is functioning. It allows us to monitor pollution levels, assess biological richness and heritage quality, and quantify habitat changes that may impact threatened species. Arthropods, Molluscs, Pisces, Birds, and Mammals are particularly sensitive to changes in the ecosystem, making them excellent indicators of ecosystem health. For specific information on the faunal diversity of Subhadra OCP (Core Zone), please refer to **Table-2.10**.

Table-2.10: Faunal Diversity within Core Zone

Sr. No.	Common Name	Scientific Name	Schedule as per WPA, 1972	Conservation Status as per IUCN	Schedule as per WPA,2022
Mammals					
1	Spotted Deer	*Axis axis*	III	LC#	II
2	Jackal	*Canis aureus*	II	LC#	I
3	Short Nosed Fruit Bat	*Cynopterus sphinx*	V	LC#	III
4	Five striped Palm Squirrel	*Funambulus pennantii*	IV	LC#	
5	Mongoose	*Herpestres edwardsii*	IV	LC#	I
6	Indian Porcupine	*Hystrix indica*	IV	LC#	I
7	Rhesus Macaque	*Macaca mulatta*	II	LC#	NL

	(Monkey)				
8	Indian Field Mouse	*Mus booduga*	V	LC#	NL
9	Common house Rat	*Rattus*	V	LC#	IV
10	India Langoor	*Semnopithecus sp*	II	LC#	II
11	Common Fox	*Vulpes bengalensis*	II	LC#	I
12	Indian Civet	*Viverricula indica*	II	LC#	I
13	Wild Boar	*Sus scorfa*	III	LC#	II
Birds					
1	Jungle Myna	*Acridotheres fuscus*	IV	LC#	II
2	Common Myna	*Acridotheres tristis*	IV	LC#	II
3	Common Kingfisher	*Alcedo atthis*	IV	LC#	II
4	Brown-cheeked Fulvetta	*Alcippe poioicephala*	IV	LC#	II
5	House Swift	*Apus affinis*	IV	LC#	II
6	Indian Pond Heron	*Ardeola grayii*	IV	LC#	II
7	Eagle Owl	*Bubo sp.*	IV	LC#	II
8	Cattle Egret	*Bubulcus ibis*	IV	LC#	II
9	Crow Pheasant	*Centropus sinensis*	IV	LC#	II
10	Golden-fronted Leaf-bird	*Chloropsis aurifrons*	IV	LC#	II
11	Blue-winged Leafbird	*Chloropsis cochinchinensis*	IV	LC#	II
12	Blue Rock Pegion	*Columba livia*	IV	LC#	II
13	White Rumped Shama	*Copsychus malabaricus*	IV	LC#	II
14	Magpie Robin	*Copsychus saularis*	IV	LC#	II
15	Indian Roller	*Coracias benghalensis*	IV	LC#	II
16	Jungle Crow	*Corvus macrorhynchos*	IV	LC#	II
17	Common Crow	*Corvus splendens*	V	LC#	III
18	Common Quail	*Coturnix coturnix*	IV	LC#	II
19	Drongo	*Dicrurus adsimilis*	IV	LC#	II

20	Lesser Golden Backed Woodpecker	*Dinopium benghalense*	IV	LC#	II
21	BlackWinged Kite	*Elanus caeruleus*	IV	LC#	II
22	Ashy-crowned Finch-lark	*Eremopterix grisea*	IV	LC#	II
23	Red Munia	*Estrildaa mandava*	IV	LC#	II
24	Koel	*Eudynamis scolopacea*	IV	LC#	II
25	Lesser Kestrel	*Falco naumanni*	IV	LC#	II
26	Common Kestrel	*Falco tinnunculus*	IV	LC#	II
27	Black Partridge	*Francolinus*	IV	LC#	II
28	Painted Partridge	*Francolinus pictus*	IV	LC#	II
29	Red Spurfowl	*Galloperdix spadicea*	IV	LC#	II
30	Red Jungle Fowl	*Gallus*	IV	LC#	II
31	Jungle Owlet	*Glaucidium radiatum*	IV	LC#	II
32	White Breasted Kingfisher	*Halcyon smyrnensis*	IV	LC#	II
33	Heart spotted Woodpecker	*Hemicircus canente*	IV	LC#	II
34	Wire-tailed Swallow	*Hirundo smithii*	-	LC#	II
35	Rufous Backed Shrike	*Lanius schach*	-	LC#	II
36	Black-headed Munia	*Lonchura malacca*	IV	LC#	II
37	Coppersmith Barbet	*Megalaima haemacephala*	IV	LC#	II
38	Crested Bunting	*Melophus lathami*	IV	LC#	II
39	Small Green Bee-eater	*Merops orientalis*	IV	LC#	II
40	Blue tailed Bee-eater	*Merops philippinus*	IV	LC#	II
41	Blue cheeked Bee-eater	*Merops superciliosus*	IV	LC#	II
42	Black Kite	*Milvus migrans*	IV	LC#	II
43	Blacknaped Flycatcher	*Monarcha azurea*	IV	LC#	II
44	Blue headed Rock Thrush	*Monticola cinclorhynchus*	IV	LC#	

45	Pied Wagtail	*Motacilla alba*	IV	LC#	II
46	Grey Wagtail	*Motacilla cinerea*	IV	LC#	II
47	Yellow Wagtail	*Motacilla flava*	IV	LC#	II
48	Large Pied Wagtail	*Motacilla maderaspatensis*	IV	LC#	II
49	Tickell's Blue Flycatcher	*Muscicapa tickelliae*	IV	LC#	II
50	Purple Sunbird	*Nectarinia asiatica*	IV	LC#	II
51	Crested Hawk Eagle	*Nisaetus cirrhatus*	I	LC#	I
52	Golden Oriole	*Oriolus*	IV	LC#	II
53	Black Headed Oriole	*Oriolus xanthornus*	IV	LC#	II
54	Tailor Bird	*Orthotomus sutorius*	IV	LC#	II
55	Grey Tit	*Parus major*	IV	LC#	II
56	Yellow-cheeked Tit	*Parus xanthogenys*	IV	LC#	II
57	House Sparrow	*Passer domesticus*	IV	LC#	II
58	Pea-fowl	*Pavo cristatus*	I	LC#	I
59	Jungle Bush Quail	*Perdicula asiatica*	IV	LC#	II
60	Small Minivet	*Pericrocotus cinnamomeus*	IV	LC#	II
61	Ashy Wren-warbler	*Prinia socialis*	IV	LC#	II
62	Blossom headed Parakeet	*Psittacula cyanocephala*	IV	LC#	
63	Rose Ringed Parakeet	*Psittacula krameri*	IV	LC#	II
64	Red Vent Bulbul	*Pycnonotus cafer*	IV	LC#	II
65	Red Whiskered Bulbul	*Pycnonotus jocosus*	IV	LC#	II
66	Pied Bush-chat	*Saxicola caprata*	IV	LC#	II
67	Collared Bush-chat	*Saxicola torquata*	IV	LC#	II
68	Indian Robin	*Saxicolo idesfulicata*	IV	LC#	II
69	Velvet-fronted Nuthatch	*Sitta frontalis*	-	LC#	II

70	Crested Serpent Eagle	*Spilornis cheela*	-	LC#	II
71	Indian Ring Dove	*Streptopelia chinensis*	IV	LC#	
72	Jungle Babbler	*Turdoides striatus*	IV	LC#	II
73	Hoopoe	*Upupa epops*	IV	LC#	II
74	Red Wattled Lapwing	*Vannelus indicus*	IV	LC#	II
Reptiles					
1	GreenVine Snake	*Ahaetulla nasuta*	IV	LC#	II
2	Garden Lizard	*Calotes versicolor*	-	-	II
3	Russel's Viper	*Daboia russelii*	IV	LC#	I
4	Geckos	*Hemidactylus flavirdis*	IV	-	
5	Indian Cobra	*Naja naja*	IV	LC#	I
6	Yellow Rat Snake	*Ptyas mucosa*	II	-	I
7	Indian Python	*Python morulus*	I	Vu#	I
8	Bengal Monitor Lizard	*Varanus bengalensis*	I	LC#	I
9	Sand Boa	*Erycinae*	IV	NT	IV
10	Banded Krait	*Bungarus fasciatus*	IV	LC	IV
Butterflies					
1	Common Emigrant	*Catopsilia pomona*	NA	NA	NA
2	Stripped Tiger	*Danaus genutia*	NA	NA	NA
3	Common crow	*Euploea core*	NA	NA	NA
4	Common Grass Yellow	*Euremahe cabe*	NA	NA	NA
5	White orange tip	*Ixias marianne*	NA	NA	NA
#LC–Least Concern; NT–Near Threatened; Vu–Vulnerable; EN–Endangered; CR–Critically Endangered					

2.11.3 Biodiversity within the Buffer Zone:

2.11.3.1 Flora:

The vegetation is fairly dense and occurs on crystalline rocks and yellow loam soils. Soil and topography vary together. It can be helpful to differentiate three sub types of topography; hilltops and plateaus, lower hill slopes and valley bottom. There is light

shruband weed growth under the forest canopy. The vegetation mainly consists of tall tress of *Shorea robusta, Tectona grandis, Terminalia tomentosa, Madhuca indica.* The vegetation can be described as moist peninsular low level Sal forest.

The floristic richness of an area can be determined by the number of plant species it contains. However, it is important to note that these species are not evenly distributed. In the buffer zone of the project, a total of 67 tree species, 19 shrub species, 37 herb species, 12 grass/bamboo species, and 5 climber species were recorded.

There were a total of 33 families documented in the tree flora. The Fabaceae family emerged as the dominant family with 10 individuals, while the Caesalpineaceae and Moraceae families each had 05 species in the tree flora. In the shrub flora, there were 15 families and 19 species, with the Acanthaceae and Fabaceae families leading with 2 species each. The herbaceous flora consisted of 36 species from 19 families, with the Cyperaceae family being the most prominent with 04 species.

Along with primary survey, the list of plants pecies reported in the Working Plans of **Angul Forest Division** has been studied out of which the main associates of Sal as observed in the field are furnished below in **Table No. 2.11.**

Table-2.11: Floral Diversity within buffer zone of study area

Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
Trees					
1	*Acacia auriculoformis*	Babul	Fabaceae	Tree	LC
2	*Acacia leucophloea*	Gohira	Fabaceae	Tree	NA
3	*Acacia nilotica*	Bandhana	Fabaceae	Tree	NA
4	*Acacia catechu*	Khair	Fabaceae	Tree	LC
5	*Adina cordifolia*	Holondo	Rubiaceae	Tree	NA
6	*Aegle marmelos*	Bela	Rutaceae	Tree	NT
7	*Alangium lamarckii*	Ankula	Cornaceae	Tree	NA
8	*Albizia lebbeck*	Kala Sirisa	Fabaceae	Tree	LC
9	*Albizia procera*	Dhala Sirisa	Fabaceae	Tree	LC
10	*Alstonia scholaris*	Chhatian	Apocynaceae	Tree	LC
11	*Artocarpus heterophyllus*	Panasa	Moraceae	Tree	
12	*Artocarpus lakoocha*	Jeotha	Moraceae	Tree	NA
13	*Azadirachta indica*	Neem	Rutaceae	Tree	LC
14	*Bauhinia purpurea*	kanchan	Caesalpiniaceae	Tree	NA

Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
15	*Bauhinia racemosa*	Ambta	Caesalpiniaceae	Tree	NA
16	*Bombax ceiba*	Simili	Malvaceae	Tree	LC
17	*Boswellia serrata*	Salai	Burseraceae	Tree	NA
18	*Buchanania lanzan*	Chara	Anacardiaceae	Tree	NA
19	*Bursera serrata*	Dongsoradi	Burseraceae	Tree	NA
20	*Butea monosperma*	Palasa	Fabaceae	Tree	NA
21	*Careyaarborea*	kumbhi	Lecythidaceae	Tree	NA
22	*Cassia fistula*	Sunari	Caesalpiniaceae	Tree	LC
23	*Cassia siamea*	Chakundi	Caesalpineaceae	Tree	NA
24	*Cleistanthus collinus*	Karada	Phyllanthaceae	Tree	VU
25	*Cochlospermum gossypium*	Ganiari	Buxaceae	Tree	NA
26	*Croton oblongifolius*	Gotha	Euphorbiaceae	Tree	NA
27	*Dalbergia latifolia*	Shisoo	Fabaceae	Tree	VU
28	*Dillenia indica*	Oau	Dilleniaceae	Tree	LC
29	*Dillenia pentagyna*	Rai	Dilleniaceae	Tree	NA
30	*Diospyros embryopteris*	Mankadakendu	Ebenaceae	Tree	NA
31	*Diospyros melanoxylon*	Kendu	Ebenaceae	Tree	NA
32	*Diospyros montana*	Hinjala	Ebenaceae	Tree	NA
33	*Ficus benghalensis*	Bara	Moraceae	Tree	NA
34	*Ficus glaberrina*	Kharsan	Maoraceae	Tree	NA
35	*Ficus religiosa*	Aswatha	Moraceae	Tree	NA
36	*Flacourtia indica*	Bhaincha	Salicaceae	Tree	LC
37	*Gardenia gummifera*	Kaapar	Rubiaceae	Tree	LC
38	*Gardenia latifolia*	Damkurudu	Rubiaceae	Tree	NA
39	*Grewia tiliifolia*	Dhaman	Tiliaceae	Tree	NA
40	*Gmelina arborea*	Gambhari	Lamiaceae	Tree	LC
41	*Holoptelea intefrifolia*	Dhaurang	Ulmaceae	Tree	NA
42	*Kydia calycina*	Kapasia	Malvaceae	Tree	NA
43	*Lagerstroemia parviflora*	Sidha	Lythraceae	Tree	NA
44	*Lannea grandis*	Indramai	Anacardeaceae	Tree	NA
45	*Madhuca indica*	Mahula	Sapotaceae	Tree	NA
46	*Mallotus philippensis*	Gundi	Euphorbiaceae	Tree	NA
47	*Mangifera indica*	Amba	Anacardiaceae	Tree	NA
48	*Mitragyna parvifolia*	Mundi	Rubiaceae	Tree	NA
49	*Polyalthia longifolia*	Debadaru	Annonaceae	Small Tree	NA
50	*Pongamia glabra*	Karanja	Fabaceae	Tree	NA
51	*Pterocarpus marsupium*	Bijasal	Fabaceae	Tree	NT
52	*Pterocarpus santalinus*	Ratka Chandan	Fabaceae		EN
53	*Santalum album*	Chandan	Santalaceae	Tree	VU

Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
54	*Sapindus laurifolia*	Ritha	Sapindaceae	Tree	NA
55	*Schleichera oleosa*	Kusuma	Sapindaceae	Tree	LC
56	*Semecarpusa anacardium*	Bhalia	Anacardiaceae	Tree	LC
57	*Shorea robusta*	Sal	Dipterocarpaceae	Tree	LC
58	*Sterculia urens*	Girdhini	Sterculiaceae	Tree	NA
59	*Sterculia villosa*	Kodala	Sterculiaceae	Tree	NA
60	*Strychnos nux-vomica*	Kochila	Loganiaceae	Tree	NA
61	*Syzygium cumini*	Jamun	Myrtaceae	Tree	LC
62	*Tamarindus indica*	Tentuli	Caesalpiniaceae	Tree	LC
63	*Tectona grandis*	Sagaun	Verbenaceae	Tree	EN
64	*Terminalia arjuna*	Arjuna	Combretaceae	Tree	NA
65	*Terminalia bellirica*	Bahada	Combretaceae	Tree	LC
66	*Terminalia chebula*	Harida	Combretaceae	Tree	NA
67	*Zizyphus jujube*	Barkoli	Rhamnaceae	Tree	NA
SHRUBS					
1	*Adhatoda vasica*	Basanga	Acanthaceae	Shrub	LC
2	*Antidesma diandrum*	Mamari	Phyllanthaceae	Shrub	NA
3	*Atalantia monophylla*	Narguni	Rutaceae	Shrub	NA
4	*Calamus guruba*	Beta	Arecaceae	Shrub	NA
5	*Calotropis gigantea*	Arakha	Asclepiadaceae	Shrub	NA
6	*Carissa spinarum*	AnkaKoli	Apocynaceae	Shrub	LC
7	*Cycas circinalis*	Arguna	Cycadaceae	Shrub	EN
8	*Eupatorium odoratum*	Pokasungha	Asteraceae	Shrub	G5
9	*Euphorbia royleana*	Siju	Euphorbiaceae	Shrub	NA
10	*Flemingia chappar*	Ranidantakathi	Fabaceae	Shrub	NA
11	*Helicteres isora*	Mura	Sterculiaceae	Shrub	NA
12	*Ixoraparviflora*	TelaKuruan	Rubiaceae	Shrub	NA
13	*Lantana camara*	Nagairy	Verbenaceae	Shrub	G5
14	*Mimosa pudica*	Lajakoli	Fabaceae	Shrub	LC
15	*Nyctanthes arbortristis*	Gangasiuli	Oleaceae	Shrub	LC
16	*Phyllanthus reticulatus*	Panjoli	Euphorbiaceae	Shrub	NA
17	*Ricinus communis*	Rendi	Euphorbiaceae	Shrub	NA
18	*Woodfordia fruticosa*	Dhatki	Lythraceae	Shrub	LC
19	*Ziziphus oenoplia*	Kantaikoli	Rhamnaceae	Shrub	NA
HERBS					
1	*Aerva lanata*	Gorakhganja	Amaranthaceae	Herb	NA
2	*Andrographis paniculata*	Bhuin Nima	Acanthaceae	Herb	NA
3	*Argemone mexicana*	Swarnchhiri	Papaveraceae	Herb	NA
4	*Boerhavia diffusa.*	Raktpunarwa	Nyctaginaceae	Herb	NA

Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
5	*Bulbostylis barbata*		Cyperaceae	Sedges	NA
6	*Cassia tora*	Chakundi	Caesalpiniaceae	Herb	NA
7	*Catharanthus roseus*	Sadabahar	Apocynaceae	Herb	NA
8	*Commelina benghalensis*	Kanchara	Commelinaceae	Herb	NA
9	*Crotalaria prostrate*	Kartik Jhumka	Fabaceae	Herb	NA
10	*Cyperus rotundus*	Motha	Cyperaceae	Sedges	LC
11	*Datura stramonium*	Dudura	Solanaceae	herb	NA
12	*Desmodium cephalotes*	Ranidanturi	Fabaceae	Herb	NA
13	*Euphorbia hirta*	Doodhi	Euphorbiaceae	Herb	NA
14	*Evolvulus alsinoides*	Sakhpushpi	Convolvulaceae	Herb	NA
15	*Fimbristylis dipsacea*	NA	Cyperaceae	Sedges	NA
16	*Fimbristylis falcata*	HathiPaw	Cyperaceae	Sedges	NA
17	*Fumaria indica*	Pitpapra	Papaveraceae	Herb	NA
18	*Heliotropium indicum*	Hastimundi	Boraginaceae	Herb	LC
19	*Ipomoe aeriocarpa*	Besharam	Convonvulaceae	Herb	NA
20	*Justicia quinqueangularis*	Justicia	Acanthaceae	Herb	NA
21	*Leucas aspera*	Bhondaki	Lamiaceae	Herb	NA
22	*Melilotus indica*	VanMaithi	Fabaceae	herb	NA
23	*Ocimum basilicum*	BanTulsi	Lamiaceae	Herb	NA
24	*Oxalis corniculata*	Teenpati	Oxalidaceae	Herb	NA
25	*Phyllanthus niruri*	BhuinAnala	Euphorbiaceae	Herb	NA
26	*Polygonum barbatum*	Polygonum	Polygonaceae	Herb	NA
27	*Polygonum glabrum*	Polygonum	Polygonaceae	Herb	NA
28	*Rauvolfia serpentina*	Sarpandha	Apocynaceae	Herb	CITES Appendix II
29	*Rungia pectinata*	Rungia	Acanthaceae	Herb	NA
30	*Sida cordifolia*	Kharenti	Malvaceae	Herb	NA
31	*Sida rhombifolia*	Atibala	Malvaceae	Herb	NA
32	*Solanum nigrum*	Makoya	Solanaceae	Herb	NA
33	*Solanum virginianum*	Katai	Solanaceae	Herb	NA
34	*Tridax procumbens*	KhalMuriya	Asteraceae	Herb	NA
35	*Triumfetta rhomboidea*	Chipki	Tiliaceae	Herb	NA
36	*Xanthium strumarium*	Gokharu	Asteraceae	Herb	NA
GRASSES&BAMBOO					
1	*Aristida adscensionis.*	Aristida	Poaceae	Grasses	NA
2	*Dendrocalamus strictus*	Salia Baunsa	Poaceae	Grasses	NA
3	*Bothriochloa pertusa*	Bothricloa	Poaceae	Grasses	NA
4	*Cenchrus ciliaris*	Cenchurus	Poaceae	Grasses	LC
5	*Chrysopogon serrulatus*	Chrysopogan	Poaceae	Grasses	NA
6	*Cynodon dactylon*	Doob	Poaceae	Grasses	NA

Sr No.	Scientific Name	Local Name	Family	Habit	Conservation Status as per IUCN
7	*Dichanthium annulatum*	Dichanthium	Poaceae	Grasses	NA
8	*Digitari astricta*	Digitaria	Poaceae	Grasses	NA
9	*Eragrostis amabilis*	Erogrostis	Poaceae	Grasses	NA
10	*Heteropogon contortus*	hetropogan	Poaceae	Grasses	NA
11	*Imperata arundinacea*	Chhana	Poaceae	Grasses	NA
12	*Symbopogon martini*	Dhanwantary	Poaceae	Grasses	NA
CLIMBERS					
1	*Abrus precatorius*	Kaincha	Fabaceae	Climber	NA
2	*Asparagus racemosus*	Shatawari	Liliaceae	Climber	NA
3	*Butea superba*	Buduli	Fabaceae	Climber	NA
4	*Gymnema sylvestris*	Gudamari	Asclepiadaceae	Climber	NA
5	*Tinospora cordifolia*	Guluchi	Menispermaceae	Climber	NA

2.11.3.2 Fauna:

The analysis of fauna requires a significant amount of time in order to comprehend the distinct characteristics of the fauna in a particular area. The evaluation of fauna was conducted through an extensive field survey of the region. During the survey, the existence of wildlife was confirmed through direct field observations, as well as through oral information provided by local residents. Additionally, data obtained from the relevant forest department has been compiled and presented below. (**Table-2.12**).

Table-2.12: Faunal Diversity from Study Area (BufferZone)

Sr.No.	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
Mammals					
1	Spotted Deer	*Axis axis*	III	LC#	II
2	Bison	*Bos gaurus*	I	VU	I
3	Jackal	*Canis aureus*	II	LC#	I
4	Sambhar	*Cervus unicolor*	III	VU	I
5	Short Nosed Fruit Bat	*Cynopterus sphinx*	V	LC#	IV
6	Indian Elephant	*Elephas maximus*	I	EN#	I
7	Wild Cat	*Felis chaus*	II	LC#	I
8	Five Striped Palm Squirrel	*Funambulus pennanti*	IV	LC#	IV
9	Mongoose	*Herpestres edwardsii*	IV	LC#	I

Sr.No.	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
11	Striped Hyena	*Hyaena hyaena*	III	NT#	I
12	Indian Porcupine	*Hystrix indica*	IV	LC#	I
14	Rhesus Macaque	*Macaca mulatta*	II	LC#	IV
15	Common Otter	*Lutra lutra*	II	VU	I
16	Indian Pangolin	*Manis crassicaudata*	I	EN#	I
17	Barking Deer	*Muntiacus muntjak*	III	LC#	II
18	Indian Field Mouse	*Mus booduga*	V	LC#	IV
19	Sloth Bear	*Melursus ursinus*	I	VU	I
20	Kalarapartia Bagh	*Panthera pardus fusca*	I	VU	I
21	Wild Boar	*Sus scrofa*	III	LC	II
22	Northern Plain Grey/ Hanuman Langur	*Semnopithecus entellus*	II	LC	II
Birds					
1	Shikra	*Accipter badius*	IV	LC#	I
2	Jungle Mynah	*Acridotheres fuscus*	IV	LC#	II
3	Common Mynah	*Acridotheres tristis*	IV	LC#	II
4	Common Iora	*Aegithina tiphia*	IV	LC#	II
5	Common Kingfisher	*Alcedo atthis*	IV	LC#	II
6	Brown-cheeked fulvetta	*Alcippe poioicephala*	IV	LC#	II
7	White Breasted Hen	*Amaauronis phoenicurus*	IV	LC#	II
8	Common Teal	*Anas crecca*	IV	LC#	II
9	Open Billed Stork	*Anas tomusoscitans*	IV	LC#	II
10	Pied Hornbill	*Anthracoceres coronatus*	I	NT#	II
11	House Swift	*Apus affinis*	IV	LC#	II
12	Tawny Eagle	*Aquila rapax*	I	VU#	II
13	Grey Heron	*Ardea cineara*	IV	LC#	II
14	Pond Heron	*Ardeola grayii*	IV	LC#	II
15	Ashy Swallow Shrike	*Artamus fuscus*	-	LC#	II
16	Spotted Owlet	*Athene brama*	IV	LC	II
17	Eagle Owl	*Bubo bubo*	IV	LC#	II
18	Cattle Egret	*Bubulcus ibis*	IV	LC#	II
19	Common Indian Nightjar	*Caprimulgus asiaticus*	IV	LC#	II

Sr.No.	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
20	Crow Pheasant	*Centropus sinensis*	IV	LC#	II
21	Pied Kingfisher	*Ceryle rudis*	IV	LC	II
22	Harada chadhei	*Crecapus phoenicopterus*	IV	LC	II
23	Whiskered Tern	*Chlidonias hybrida*	-	LC#	II
24	Golden-fronted Leaf-bird	*Chloropsis aurifrons*	IV	LC#	II
25	Blue-winged Leafbird	*Chloropsis chochinchinensis*	IV	LC#	II
26	White Necked Strork	*Ciconia episcopus*	IV	VU#	II
27	Pied Crested Cuckoo	*Clamator jacobinus*	IV	LC#	II
28	Blue Rock Pigeon	*Columba livia*	IV	LC#	NL
29	White Rumped Shama	*Copsychus malabaricus*	IV	LC#	II
30	Magpie Robin	*Copsychus saularis*	IV	LC#	II
31	Indian Roller	*Coracias benghalensis*	IV	LC#	II
32	Large Cuckoo- shrike	*Coracina novaehollandiae*	-	LC#	II
33	Jungle Crow	*Corvus macrorhynchos*	IV	LC#	II
34	Common Crow	*Corvus splendens*	V	LC#	II
35	Common Quail	*Coturnix coturnix*	IV	LC#	II
36	Brain-fever bird	*Cuculus varius*	IV	LC#	II
37	Indian Tree Pie	*Dendrocitta vagabunda*	IV	LC#	II
38	Lesser Whistling Teal	*Dendrocygna javanica*	IV	LC#	II
39	Tickell's Flower Pecker	*Dicaeum erythrarthynchos*	IV	LC#	II
40	Fire-breasted Flower Pecker	*Dicaeum ignipectus*	IV	LC#	II
41	Black Drongo	*Dicrurus macrocercus*	IV	LC#	II
42	White-bellied Drongo	*Dicrurus caerulescens*	IV	LC#	II
43	Greater Racket- tailed Drongo	*Dicrurus paradiseus*	IV	LC#	II
44	Lesser Golden Backed	*Dinopium*	IV	LC#	II

Sr.No.	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
	Woodpecker	*benghalense*			
45	Little Egret	*Egretta garzetta*	IV	LC#	II
46	BlackWinged Kite	*Elanus caeruleus*	IV	LC#	II
47	Ashy-crowned Finch-lark	*Eremopterix grisea*	IV	LC#	II
48	Red Munia	*Estrilda amandava*	IV	LC#	II
49	Asian Koel	*Eudynamys scolopaceus*	IV	LC#	II
50	Lesser Kestrel	*Falco naumanni*	IV	LC#	II
51	Common Kestrel	*Falco tinnunculus*	IV	LC#	II
52	Black Partridge	*Franco linusfrancolinus*	IV	LC#	II
53	Painted Partridge	*Francolinus pictus*	IV	LC#	II
54	Grey Partridge	*Francolinus pondicerianus*	IV	LC#	II
55	Fantail Snipe	*Gallinago gallinago*	IV	LC#	II
56	Moorhen	*Gallinula chloropus*	IV	LC#	II
57	Red Spurfowl	*Galloperdix spadicea*	IV	LC#	II
58	Red Jungle Fowl	*Gallus gallus*	IV	LC#	II
59	Myna	*Gracula religiosa*	IV	LC	II
60	Jungle Owlet	*Glaucidium radiatum*	IV	LC#	II
61	White Breasted Kingfisher	*Halcyon smyrnensis*	IV	LC#	II
62	Brahmani Kite	*Haliastur indus*	IV	LC	II
63	Heart spotted Woodpecker	*Hemicircus canente*	IV	LC#	II
64	Black-winged Stilt	*Himantopus himantopus*	IV	LC#	II
65	Indian Cliff Swallow	*Hirundo fluvicola*	-	LC#	II
66	Wire-tailed Swallow	*Hirundo smithii*	-	LC#	II
67	Pheasant Tailed Jacana	*Hydrophasianus chirurgus*	IV	LC#	II
68	Rufous Backed Shrike	*Lanius schach*	-	LC#	II
69	Black-headed Munia	*Lonchura malacca*	IV	LC#	II
70	Coppersmith Barbet	*Megalaima haemacephala*	IV	LC#	II
71	Crested Bunting	*Melophus lathami*	IV	LC#	II

Sr.No.	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
72	Small Green Bee-eater	*Merops orientalis*	IV	LC#	II
73	Blue tailed Bee-eater	*Merops philippinus*	IV	LC#	II
74	Blue cheeked Bee-eater	*Merops superciliosus*	IV	LC#	II
75	Bronze Winged Jacana	*Metopidius indicus*	IV	LC#	II
76	Black Kite/Pariah Kite	*Milvus migrans*	IV	LC#	II
77	Gobara chadhei	*Molpates cafer*		LC#	II
78	Black naped Flycatcher	*Monarcha azurea*	IV	LC#	II
79	Blue headed Rock Thrush	*Monticola cinclorhynchus*	IV	LC#	II
80	Pied Wagtail	*Motacilla alba*	IV	LC#	II
81	Grey Wagtail	*Motacilla cinerea*	IV	LC#	II
82	Yellow Wagtail	*Motacilla flava*	IV	LC#	II
83	Large Pied Wagtail	*Motacilla maderaspatensis*	IV	LC#	II
84	Tickell's Blue Flycatcher	*Muscicapa tickelliae*	IV	LC#	II
85	Purple Sunbird	*Nectarinia asiatica*	IV	LC#	II
86	Golden Oriole	*Oriolus oriolus*	IV	LC#	II
87	Black Headed Orole	*Oriolus xanthornus*	IV	LC#	II
88	Tailor Bird	*Orthotomus sutorius*	IV	LC#	II
89	Grey Tit	*Parus major*	IV	LC#	II
90	Yellow-cheeked Tit	*Parus xanthogenys*	IV	LC#	II
91	House Sparrow	*Passer domesticus*	IV	LC#	II
92	Pea fowl	*Pavo cristatus*	I	LC#	I
93	Jungle Bush Quail	*Perdicula asiatica*	IV	LC#	II
94	Small Minivet	*Pericrocotus cinnamomeus*	IV	LC#	II
95	Scarlet Minivet	*Pericrocotus flammmeus*	IV	LC#	II
96	Small Indian Cormorant	*Phalacrocorax niger*	IV	LC#	II
97	Black Redstart	*Phoenicurus ochruros*	IV	LC#	II
98	Yellow-fronted Pied Woodpecker	*Picoides mahrattensis*	IV	LC#	II
99	Indian Pitta	*Pitta brachyura*	IV	LC#	II
100	Weaver Bird	*Ploceus*	IV	LC#	II

Sr.No.	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
		philippinus			
101	Eastern Golden Plover	*Pluvialis dominica*	IV	LC#	II
102	Slaty-headed Scimitar Babbler	*Pomatorhinus horsfieldi*	IV	LC#	II
103	Purple Moorhen	*Porphyrio porphyrio*	IV	LC#	II
104	Ashy Wren Warbler	*Prinia socialis*	IV	LC#	II
105	Blossom headed Parakeet	*Psittacula cyanocephala*	IV	LC#	II
106	Large Indian Parakeet	*Psittacula eupatria*	IV	NT#	II
107	Rose Ringed Parakeet	*Psittacula krameri*	IV	LC#	II
108	Red Vented Bulbul	*Pycnonotus cafer*	IV	LC#	II
109	Red Whiskered Bulbul	*Pycnonotus jocosus*	IV	LC#	II
110	White-throated Fantail Flycatcher	*Rhipidura albicollis*	IV	LC#	II
111	White-browed Fantail Flycatcher	*Rhipidura aureola*	IV	LC#	II
112	Painted Snipe	*Rostratula benghalensis*	IV	LC#	II
113	Pied Bush-chat	*Saxicola caprata*	IV	LC#	II
114	Collared Bush-chat	*Saxicola torquata*	IV	LC#	II
115	Indian Robin	*Saxicoloides fulicata*	IV	LC#	II
116	Chestnut-bellied Nuthatch	*Sitta castanea*	IV	LC#	II
117	Velvet-fronted Nuthatch	*Sitta frontalis*	IV	LC#	II
118	Crested Serpent Eagle	*Spilornis cheela*	IV	LC#	II
119	Spotted Dove	*Streptopelia chinensis*	IV	LC#	II
120	Indian Ring Dove	*Streptopelia decaocto*	IV	LC#	II
121	Spotted Dove	*Spilopelia chinensis*	IV	LC	II
122	Red Turtle Dove	*Streptopelia tranquebarica*	IV	LC#	II
123	Pied Mynah	*Sturnus contra*	IV	LC#	II
124	Grey-Headed Myna/Chestnut-tailed starling	*Sturnus malabaricus*	IV	LC#	II
125	Black-headed Myna/brahminy Myna	*Sturnus pagodarum*	IV	LC#	II

Sr.No.	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
126	Rosy Pastor	*Sturnus roseus*	IV	LC#	II
127	Indian Paradise Flycatcher	*Terpsiphone paradisi*	IV	LC#	II
128	Black Headed Ibis	*Threskiornis melanocephalus*	IV	NT#	II
129	Indian Grey Hornbill	*Tokus birostris*	IV	LC#	II
130	Yellow-footed Green Pigeon	*Treron phoenicoptera*	IV	LC#	II
131	Common Redshank	*Tringa totanus*	IV	LC#	II
132	Jungle Babbler	*Turdoides striatus*	IV	LC#	II
133	Hoopoe	*Upupa epops*	IV	LC#	II
134	Red Wattled Lapwing	*Vannelus indicus*	IV	LC#	II
135	Black Dongo	*Dicrurus macrocercus*	IV	LC	II
136	Indian Cuckoo	*Eudynamis scolopaclus*	IV	LC	II
Reptiles					
1	Garden Lizard	*Calotes versicolor*	-	LC	NL
2	Russel's Viper	*Daboia russelii*	IV	LC#	I
3	Green Vine Snake	*Ahaetulla nasuta*	IV	LC	II
4	Common Skink	*Mabuya carinata*	-	LC#	NL
5	Indian Cobra	*Naja naja*	IV	LC#	I
6	Yellow Rat Snake	*Ptyas mucosa*	II	-	I
7	Indian Python	*Python morulus*	I	Vu#	I
8	Monocellata Cobra	*Naja naja kuothia*	II	LC	I
9	King Cobra	*Ophiophagus hannah*	II	VU	I
10	Bengal Monitor Lizard	*Varanus bengalensis*	I	LC#	I
11	Russel's Viper	*Vipera russelii*	II	NA	I
12	Checkered Keelback	*Xenochrophis piscator*	IV	LC	I
Fishes					
1	Mahurali	*Amblypharyngodon mola*	NA	LC	NA
2	Bhakura	*Catla catla*	NA	LC	NA
3	Mirkali	*Cirrhina mrigla*	NA	LC	NA
4	Magura	*Clarias batrachus*	NA	LC	NA
5	Dand Khirri	*Esomus dandrica*	NA	LC	NA
6	Singi	*Heterophneustes*	NA	LC	NA

Sr.No.	Common Name	Scientific Name	Schedule of WPA, 1972	Conservation Status as per IUCN	Schedule of WPA, 2022
		fossil			
7	Rohi	*Labeo rohita*	NA	LC	NA
8	Todi	*Mastacembelus armatus*	NA	LC	NA
9	Kantia	*Myotus cavasius*	NA	LC	NA
10	Chitala	*Notopterus chitala*	NA	LC	NA
11	Phalli	*Notopterus notopterus*	NA	LC	NA
12	Jalanga	*Pangasius pangasius*	NA	LC	NA
13	Chenga	*Ophiocaphalus gachua*	NA	LC	NA
14	Seula	*Ophiocaphalus striatus*	NA	LC	NA
15	Balia	*Waalngonia attu*	NA	VU	NA
Tortoise					
1	Land Tortoise	*Testudo eleonguta*	IV	CR	I
2	Water Tortoise	*Lissemys punctata*	IV	VU	I
Butterflies					
1	Common Emigrant	*Catopsilia pomona*	NA	NA	NA
2	Common map	*Cyrestis thyodamas*	NA	NA	NA
3	Stripped Tiger	*Danaus genutia*	NA	NA	NA
4	Plain Tiger	*Danaus chrysippus*	NA	NA	NA
5	Common crow	*Euploea core*	NA	NA	NA
6	Common Grass Yellow	*Eurema hecabe*	NA	NA	NA
7	Western blue sapphire	*Heliophorus sp.*	NA	NA	NA
8	Danaid Egg Fly	*Hypolimnas misippus*	NA	NA	II
9	White orange tip	*Ixias marianne*	NA	NA	NA
10	Blue Pancy	*Junonia orithya*	NA	NA	NA
11	Common evening Brown	*Melanitis leda*	NA	NA	NA
12	Common Bush Brown	*Mycalesis perseus*	NA	NA	NA
13	Lime butterfly	*Papilio demoleus*	NA	NA	NA
# LC –Least Concern; NT –Near Threatened; VU–Vulnerable; EN–Endangered; CR–Critically Endangered					

(Source: Primary Survey Data) Note: -NA=Not assessed yet,)

2.11.4 Aquatic Ecology:

The biological species are the best indicators of environmental quality. This includes different species, such as, phytoplankton, zooplankton, benthos, fishes etc. Studies on biological aspects of certain ecosystems are an important part of any environmental impact Assessment in view of the need for conservation of environmental quality and safety of aquatic life.

From the baseline survey on existing aquatic environmental conditions in and around the proposed Project the following data were generated:

- Biological characteristics of river water
- Inventorization of phytoplankton and Zooplankton
- Present status of riverine fish fauna: Identification of fish species
- Migratory pattern, feeding and breeding grounds of the fish fauna
- Assessment of local catches during the field trips to assess the fish fauna

2.11.4.1 Assessment of Aquatic diversity:

The samples for qualitative and quantitative analysis of planktons were collected from the sub surface layer at knee depth. Water samples were filtered through plankton net of 20µmesh size (APHA, 1971). The filtered samples were concentrated by using the centrifuge. By using Lackey's drops method and light microscope (Lackey, 1938), the qualitative analysis was carried out for phytoplankton and zooplankton (**Table 2.13**). The standard flora and other literature were followed for the qualitative evaluation of Plankton.

Table-2.13: Phytoplankton and Zooplanktons Recorded in the Study Area

Sl. No.	Phytoplankton Species	Zooplankton Species
1.	*Naviculasp. (Diatom)*	*Daphnia sp.*
2.	*Cyclotellasp. (Diatom)*	*Moina sp.*
3.	*Synedrasp. (Diatom)*	*Paramecium sp.*
4.	*Pinnulariasp. (Diatom)*	*Euglena sp.*
5.	*Oscillatoria sp.*	*Ranatra sp.*
6.	*Nostoc sp.*	*Larvae of culex sp.*
7.	*Anabaena sp.(Diatom)*	*Larvae of Dytiscus sp.*
8.	*Spirogyra sp.*	*Cyclops sp.*
9.	*Pediastrum. sp.*	*Diaptomus sp.*
10.	*Microspora sp.*	

2.11.4.2 Aquatic Floral Diversity:

Wetlands are very useful to us. By producing resources, enabling recreational activities

And controlling flood and pollution, they contribute to the national and local economies and environmental consequences. Wetlands provide important and incredible services to society, these services can neither be sold nor do they have the market value and tried to give wetlands an economic value.

Table-2.14: Wetland/Marshland Diversity of Study area

Family	Botanical Name	Local Name
Salviniaceae	*Azolla pinnata*	Mosquito Fern
Commelinaceae	*Commelina benghalensis*	Kana
Cyperaceae	*Cyperus alternifolius*	UmbrellaS edge
Poaceae	*Echino chloacolona*	Shama
Pontederiaceae	*Eichho rniacrassipes*	Jal Kumbhi
Lemnaceae	*Lemna minor*	DuckWeed
Onagraceae	*Ludwigia adscendens*	Water Primrose
Marsileaceae	*Marsilea quadrifolia*	Four Leaf Clover
Oxalidaceae	*Oxalis corniculata*	Amrul
Ranunculaceae	*Ranunculus sceleratus*	Aglaon
Typhaceae	*Typha angustifolia*	Patera

2.11.5 Details of Endemic, Threatened and Scheduled Species:

As per list of **The Indian Wildlife (Protection) Act, 1972,** Fauna coming under the **Schedule-I** are treated as endangered species. The **schedule - I** fauna as per reconnaissance survey are listed in **Table-1.12**. Although these are very common species and found in every locality, even in villages, certain steps should be taken to conserve the critical wildlife:

I. Programs for the conservation of wildlife will be formulated and implemented outside the protected areas by educating the local communities with help of local public agencies, and other stakeholders including the environment division officers of our company, in order to reduce the scope of man-animal conflict.

II. It will be ensured that human activities on the fringe of the protected areas do not degrade the habitat.

Over all, the status of wildlife in a region is an accurate index of the state of ecological resources, and thus, of the natural resources base of human well-being. This indicates the Interdependent nature of ecological entities (the web of life), in which wildlife is a

vitallink and a base of eco-tourism. Thus, the importance of conserving and protecting wildlife will be spread among the local people.

Table 2.15 list of Scheduled species (IWPA-1972) from study area

Sr.No.	Scientific name	Common Name	Schedule
Mammals			
1	Elephas maximus indicus	Elephant	Schedule-I
2	Manis crassicaudata	Pangolin	Schedule-I
3	Melursus ursinus	Sloth Bear	Schedule-I
4	Panthera pardus	Bagh	Schedule-I
Reptiles			
5	Varanus bengalensis	Bengal Monitor Lizard	Schedule-I
6	Python molurus	Python	Schedule-I
Birds			
7	Pavo cristatus	Indian Peafowl	Schedule-I
8	Aquila rapax	Tawny Eagle	Schedule-I
9	Anthracoceros coronatus	Pied Hornbill	Schedule-I
10	Nisaetus cirrhatus	Hawk-eagle	Schedule-I

So far, according to our study and from the available literature, there is no endemic plant and species present in this area. A brief note on facts on these animals is as follows

2.11.6 Status of Schedule-I Fauna present in the study area:

1. **Elephant (*Elephas maximus indicus*):**

Elephants have not been sighted within the mining lease area or the impact area. However, there have been documented instances of elephant movement occurring far beyond the lease area in the Angul district of Odisha State. According to the Ministry of Environment, Forest & Climate Change, there are a total of 2,865 elephants in Odisha, Jharkhand, and Chhattisgarh. Out of these, Odisha accounts for nearly 70% with 1,930 elephants, followed by Jharkhand with 688 elephants and Chhattisgarh with 247 elephants as of 2012. While Jharkhand is renowned for being a habitat and transit route for elephants, its boundary is significantly distant from the lease area. The movement of elephants has also been observed in the eastern part of the Renukoot Dam. However, this dam acts as a substantial barrier preventing elephants from approaching anywhere near the current Subhadra OCP mine lease area. The movement of elephants and other large wildlife in the Talcher Forest Division is depicted in Figure-1.3, which showcases a map titled "Diverted wildlife corridor due to coal mines" obtained from the forest department of Talcher Forest Division.

Habitat: Elephants are versatile animals, although they primarily inhabit scrub forests. While they can be spotted in jungles, they tend to stay near the outskirts where they have access to open, grassy spaces. They have a preference for areas that offer a combination of grass, low woody plants, and forest cover. Elephants typically do not stay in one foraging area for an extended period, usually moving on after a few days. The movement of elephants is primarily influenced by the availability of food, water, and shade, which are the three fundamental resources for them (Sukumar et al, 2003). Their home-range can vary from 30 to 600 square kilometers.

Food: Elephants eat a wide variety of species of vegetation. They are herbivore, folivore and lignivore. More than 100-130 different species of plants may be eaten They prefer grasses, but they also consume bark, roots, leaves, wood, stems and leaves of trees, vines, shrubs, tubers, bamboo and barn, an average day's intake is 150-200kg of wet vegetation. The proportions of the different plant types in their diet vary depending upon the habitat and season. Annual diet has been found to be dominated by grass. Maximum straying distance covered by the raiding elephant has been recorded upto 5.5 km.

Time activity budget of elephants: Generally, they are active almost throughout the day during rainy and winter months, but during summer months they are active only in the morning and evening hours. They become active well before dawn and start their morning activities in the vicinity of the area where they spent night. Evening hour is the time for drinking and bathing especially during summers. In summer season percentage of movement is more due to lack of fodder species and shrinkage of natural water sources.

Food Plants: Following is a list of plants reported as food by different workers. However, only the names of plants, local to the area, have been taken and the local names have been changed. Part of the plant eaten may be different for the different species.

Threats: The Asian elephant faces numerous challenges in the present day, primarily stemming from habitat loss, degradation, agricultural and farming activities, grazing, mining, human interference, trade, pollution, ivory hunting, insurgency, corridor loss, anthropogenic pressures on their habitat, conflicts between humans and elephants, forest fires, and illegal captures of live animals. Additionally, poisoning and disease pose further threats to these majestic creatures.

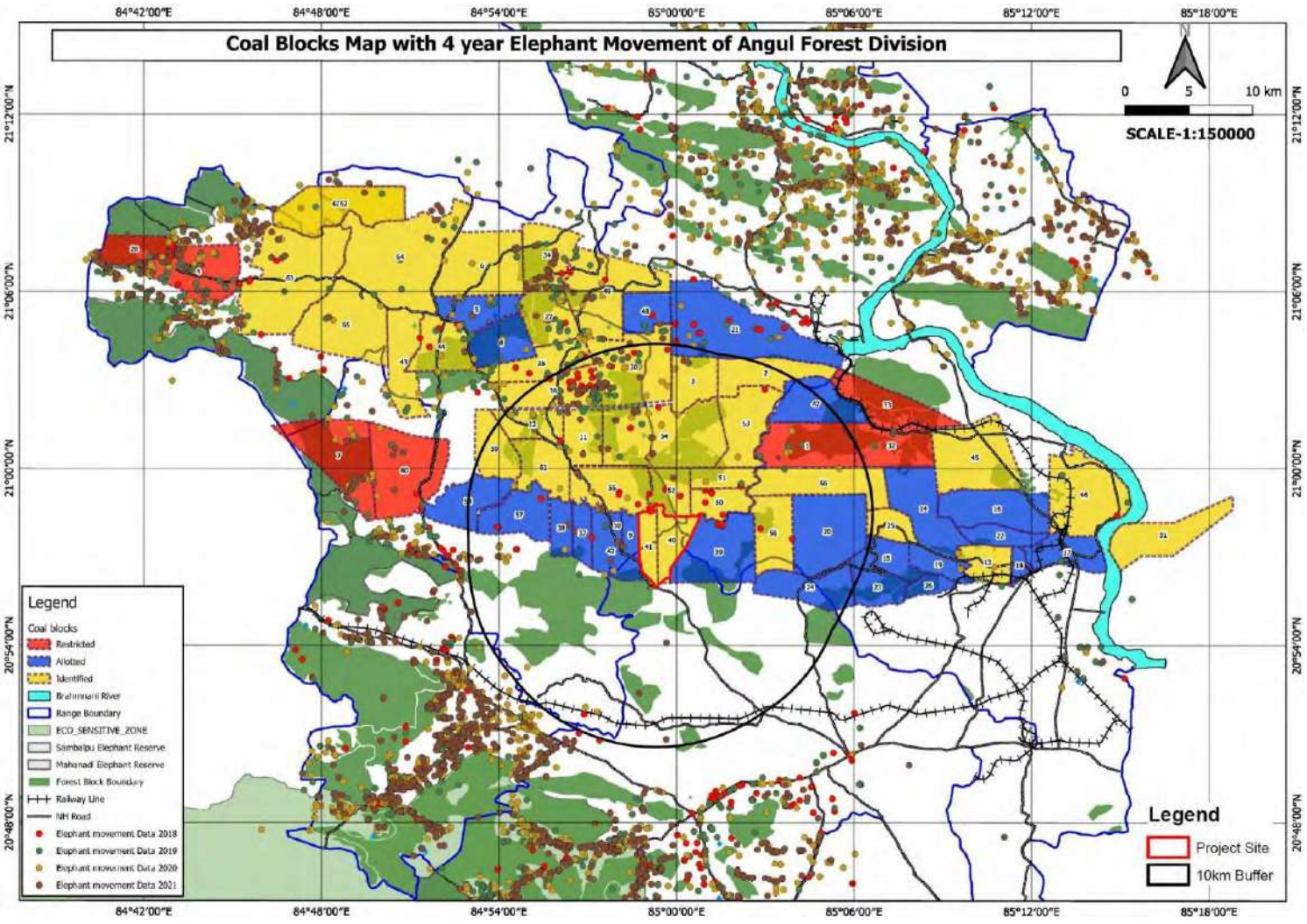


Figure-2.1: Elephant Movement in Angul Forest Division

Table-2.16: List of Food Plants for Elephant

Sr.No.	Botanical Name	Local Name
1	Acacia catechu	Khair
2	Acacia nilotica	Babool
3	Aegle marmelos	Bel
4	Albizzia lebbek	Kalasiris
5	Bambusa arundinacea	Bans
6	Albizzia procera	Safedsiris
7	Bauhinia variegata	Kachnar
8	Bauhinia vahlii	Mahul
9	Bauhinia malabarica	Khatua
10	Bombax ceiba	Semal
11	Brachiaria sp.	Ghas
12	Bridelia retusa	Kasai
13	Careya arborea	Kumhi
14	Cordia myxa	Lassora
15	Cymbopogon flexuosus	Ghas
16	Cynodon dactylon	DoobGrass
17	Dalbergia sissoo	Shisham
18	Dendrocalamus strictus	Bans/ Bamboo
19	Desmostachya bipinnata	Urai/Khus
20	Eleusine sp.	Ghas
21	Emblica officinalis	Amla
22	Eucalyptus sp.	Nilgiri
23	Eulaliopsis binata	BagaiGhas
24	Feronia elephantum	Kaith
25	Ficus bengalensis	Bargad/Bar
26	Ficus glomerata	Dumar/Gular
27	Ficusreligiosa	Pipal
28	Ficus rumphii	Duranga-hesa
29	Ficus infectoria	Pakar
30	Flacourtia indica	Kandai
31	Garuga pinnata	Kekad
32	Grewia elastica	Dhaman
33	Helicteres isora	Ainthi
34	Holarrhena antidysenterica	Korea
35	Ipomoea sp.	Karmata
36	Imperata arundinacea	Ulu
37	Kydia calycina	Baranga/Pula
38	Lagerstroemia parviflora	Senha/Sidha

Sr.No.	Botanical Name	Local Name
39	Limonia acidissima	Kaith
40	Mallotus philippinensis	Sinduri/Rohini
41	Mimosa pudica	Lajwanti
42	Mitragyna parvifolia	Mudhi
43	Musa paradisiaca	Banana
44	Neyraudia arundinacea	Bichhloo
45	Oryza sativa	Dhan
46	Ougeinia oojeinensis	Tinsa
47	Phoenix humilis	ButaChhind
48	Pithecellobium dulce	JangalJalebi
49	Randia dumetorium	Mainphal
50	Saccharum munja	Kandi-khar
51	Saccharum officinarum	Ganna
52	Saccharum spontaneum	Kans
53	Sansevieria sp.	Sisal
54	Schleichera oleosa	Kosam/Kusum
55	Shorea robusta	Sarai/Sal
56	Syzygium cumini	Jamun
57	Tamarindus indica	Amli/ Imli
58	Terminalia tomentosa	Saja
59	Tectona grandis	Sagaun/Teak
60	Tinospora cordifolia	Giloe/Gurch
61	Thysanolaena agrostis	Hathighas/Pirlu
62	Zizyphus mauritiana	Bhander
63	Zizyphus xylopyra	Ghont

Elephant Corridor: There are no designated elephant corridors within a 10 km radius of the project site. Nevertheless, according to the Forest Division's report, elephants do migrate between important forest blocks within their habitat. The movement track for these elephants is formed by revenue forestlands, Demarcated Protected Forests (DPF), and village forest areas that connect these isolated forest blocks. Unfortunately, the central Indian elephant habitats have become highly fragmented and degraded due to encroachment, shifting cultivation, and mining activities.

Disturbance of elephant movement due to project activities: The mining zone does not have an elephant corridor and the forest department and primary study has not reported or recorded any elephant presence. A pathway for the movement of elephants, known as the Kanheijharan-Anantpur corridor, exists adjacent to the buffer area of project, providing a

secure route for their passage. This corridor serves as a significant pathway for elephants in the region.

2. Indian Pangolin (*Manis crassicaudata*):

Manis Crassicaudata are insectivorous mammals understood to occur in various types of tropical forests as well as open land, grasslands and degraded habitats, including in close proximity to villages. It is a medium-sized mammal, with a streamline elongated body and tail covered with large overlapping scales rather than fur. Indian Pangolin is widely distributed in India, except the arid region, high Himalayas and the North-East. It can be found at elevation upto 2500m. The species also occurs in Bangladesh, Pakistan, Nepal and SriLanka.

Habitat: *Manis crassicaudata* occupy a variety of habitats. They have been found in tropical rainforests, subtropical thorn forests, plains and the lower slopes of mountains. The Indian pangolin is solitary, mostly nocturnal, and terrestrial.

Ecology and Behavior: These pangolins dig their own burrows in the ground, at depths of1.5-6 m; these are frequently under large rocks and the entrance is often hidden with soil. When in danger, they rollup into balls, with their large tails pressed tightly against face and belly to help protect them. Longevity of this animal in captivity can exceed 19 years.

These pangolins are not often observed in the wild due to their solitary, secretive, and nocturnal nature. A loud emission of a hissing sound has been reported when they are frightened or angry.

Food: The Indian pangolin is almost entirely insectivorous and more specifically amyrmecophage (ant/termite specialist). Its diet includes beetles, cockroaches, termites, and possibly worms, but mainly ants and termites. It feeds on the eggs, larvae, and adults of its prey, but eggs are the preferred choice. The Indian pangolin is nocturnal and uses its well-developed sense of smell to locate ant nests or termite mounds and other food sources. Pangolins tear apart and dig into mounds by using the three center claws on their forefeet, throwing loose soil backwards with their hind feet. When feeding, the rostral part of the pangolin's tongue is quickly inserted and withdrawn to capture prey. This movement is also used for drinking.

Conservation Status: The species is therefore listed as endangered in the IUCN Red List of Threatened Species; under the Schedule I of the Wildlife (Protection) Act 1972 of India

and included in Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

3. Bengal Monitor Lizard (Varanus bengalensis):

Habit: They are often found in agricultural areas. Bengal monitors shelter in burrows that they dig or crevices in rocks and abandoned termite mounds. It is mostly diurnal in habit.

Habitat: It is found in a wide range of habitats, *viz.* forest, river banks, by the side of nullah, and agricultural land. It occupies burrows, dense vegetation, hollows of trees, rock cracks and crevices.

Behavior: Mainly ground dweller, but is a very good climber as well. Bengal Monitors are usually solitary and usually found on the ground although the young are often seen on trees. They shelter and spend nights in burrows or crevices in rocks, make use also of abandoned termite mounds. In the night their body temperature drops below ambient. In the morning they raise their body temperatures by basking before commencing activity and for this reason they are rarely active early in the morning and most active in the afternoons when temperatures are highest.

Food: Their normal prey consists of beetles, grubs, orthopterans, scorpions, crabs, snails, ants and other invertebrates. Vertebrate prey is comparatively rare and includes frogs, fish, other lizards, snakes, birds and their eggs and rodents. They sometimes capture roosting bats.

Threat: Monitor lizards are hunted for skin and their body fat. Its eggs are considered a delicacy and the entire animal is also eaten. Unani, the Greco-Arabian system of medicine, recommends the use of various body parts of monitors to cure numerous ailments. The population of the Common Indian Monitor, ***Varanus bengalensis*** has alarmingly dwindled throughout the Indian sub-continent mainly due to excessive exploitation of the adults for their commercially valuable skins, as food and in traditional medicines. Habitat loss due to large-scale deforestation, urbanization, dams and hydroelectric projects and other biotic factors are also responsible for the population decline of the species.

Conservation Status: Status: Not Listed (IUCN 2000); Endangered (ESA). Schedule Indian Wildlife (Conservation) Act, 1972.

4. Indian Python (Python molursus):

Habitat: It is a non-poisonous, lethargic and slow-moving snake, exhibiting little if any timidity and rarely rousing itself seriously to escape, even when attacked. Diurnal and/or

nocturnal habit depends upon the degree of disturbance from human in their environment. The snake hibernates in cold season, in any convenient retreat. There are very few records of attack on human beings are also there in the area.

Food: Feeds on mammals, birds and reptiles, but prefers mammals. Stomach content hash own frogs, toads, monitor lizard, wild duck, peafowl, poultry, rat, hare, porcupine, langur, jackal, mousedeer, and hogdeer, chital, smabar fawn, barking deer, chinkara and leopard. Thus has a very wide range of food items.

Threats: It is killed for flesh and skin. However, in the presently applied lease area it is not eaten. Killing for skin is also not reported in the area. However, it is killed only because it is a snake.

Conservation: The snake, although occurs in the area but is rare. Reports of its conflicts with human being are extremely rare. Public awareness is the most important method for its conservation.

Conservation Status: This species is classified as Lower Risk/Near Threatened (LR/NT) on the IUCN Red List of Threatened Species (v2.3, 1994). This means that it has been evaluated, but does not satisfy the criteria for any of the categories Critically Endangered, Endangered or Vulnerable. However, it is considered Near Threatened (NT), meaning that it does not qualify for Conservation Dependent, but is close to qualifying for Vulnerable. Year assessed: 1996.

2.11.7 Conservation plan for Schedule-I Bird Species:

Birds, occupying higher trophic levels in the ecosystems, respond quickly to the changes in the habitats and therefore serve as one of the best indicators for evaluating the ecological status and functioning of ecosystems of the area. Therefore, we created baseline data on birds by systematically collected data on occurrence in the core and buffer areas separately. For creating baseline data on birds, we carried out bird surveys in different habitats as differential habitat preferences are seen in birds. Based on our extensive field visits, literature survey, and consultation local people, we found 8 bird species of high conservation significance as they belong to Schedule-I of Indian Wildlife Protection Act1972.

Occurrences of birds in the study area are mainly due to the overall ecological condition which provides them suitable habitats where they obtain their food and safety for their

breeding or wintering in the region. Therefore, any changes or degradation of air, soil and water quality would lead to degradation of vegetation and habitats of birds. Increased noise levels and disturbance levels would result in their displacement form the core area and its immediate surroundings. Direct disturbance by presence of people, vehicle, their noise, vibrations, lights, etc. Can potentially displace most of the birds' species from core area.

Therefore, it is recommended that project proponent shall take utmost care in controlling dust, fugitive emissions and put in place all pollution control measures during construction phase which would not result in degradation of air, soil, water qualities that affect the surrounding forest areas and vegetation. It is also recommended that workers shall be strictly instructed so that they don't engage in poaching of birds. It is further recommended that project proponent shall monitor the ecological status of the study area including species of birds and their habitats as part of their periodic comprehensive biodiversity monitoring programme.

2.11.8 Movement of Mega Wildlife:

Elephant is the flagship species of this area and the only mega herbivore (wildlife) with long ranging movement behavior, present in the Angul Forest Division. Elephants have not been reported from the mining lease area. However, there are reports of the movement of elephants, surrounding the lease area. Elephants follow streams and move in valleys and unless hard pressed try to avoid hilly terrain to conserve energy. This behavior exposes them close to human habitation.

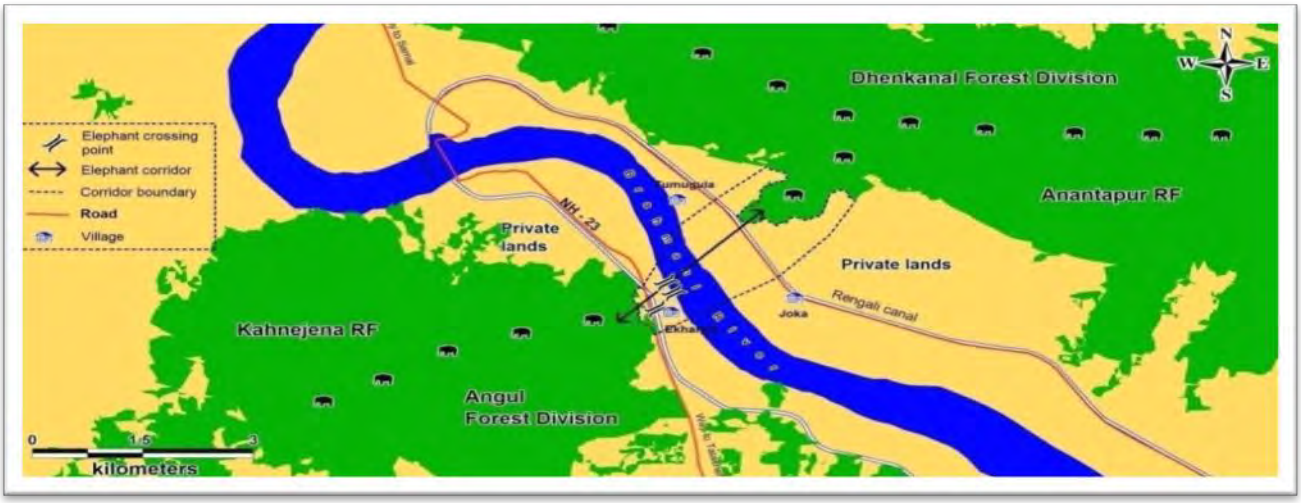
Due to qualitative and quantitative decline of wildlife habitat including loss of prey base in the Division and loss of connectivity and fragmentation of the habitat, there are increase in man-animal conflicts. Studies shows that the changing land use in the peripheries of the PA's due to demographic changes are affecting wildlife habitats. These pressures influence the movement pattern, habitat utilization and behavior leading to regular increase in the race for survival between man and animals. There is no protected area within the 10 km radius of the project. During the paddy harvesting season elephants are found to be roaming around the nearby villages.

Elephants generally migrate from the forests of Satkosia wildlife Division to Nuakheta, Bolong, Krushnachakra, Burti, Antulia-Tabada blocks of Raigada, Angul & Jarapada Ranges & from Keonjhar, Deogarh Divisions to Bulajhar, Phuuljhari, Nialu-Lodhajhari-Sapkata blocks of Talcher, Kaniha Ranges.

2.11.9 Kahneijena - Anantapur INTER - DISTRICT

This corridor connects Kanheijena Reserve Forest of Angul Forest Division with AnantapurReserve Forest of Dhenkanal Forest Division. Elephants from Satkosia WLS, Handapa ReserveForest move through adjoining forest patches of Simuliapadar RF, Durgapur RF, Nisha PF, KuioPF, Kauchiakhol RF, Rakas RF and Kanheijena RF to Anantapur RF. National Highway-23,construction of Rengali Irrigation canal, establishment of brick kilns on the Brahmani River bank
and presence of industries (Fly Ash Brick Plant, Sponge Iron and Tar Refinery) in Ekaghariavillage are the hurdles in the corridor affecting elephant use severely.

Corridor dependent villages
Ekagharia, Bikisar, Bilinda, Jaka, Tumugula, Dangarbeda, Patuapali and Sarasikipal



At present Animal / Elephant movement along the corridor has been reduced due to Construction of Rengali Right and left Canals, Development of Roads / National Highways, and avoidance of animals due to Coal mining and related traffic pressure day and night.

2.11.10 Satkosia Tiger Corridor:

Forest Blocks which are part of the Kanheijena-Anantpur Elephant Corridor are also part of the Similipal - Satkosia Tiger Corridor as identified by the NTCA. As this corridor is very import and for maintaining animal movement between Similipal and Satkosia, it is also important for the survival of viable population in the SatkosiaTigerReserve. At present no RBT is reported in Satkosia Tiger Reserve.

Remarks in the Site Inspection Report (SIR):

The wild animals observed in the core area are Wild Boar, Barking Deer Indian Hare, Languor, Jackal, Peafowl, Blue Jay, Egrets, Kingfisher, Drango. On rare and endangered animal: No rare and endangered animal observed. (Site Inspection Report of DFO, Angul is at **Annexure-VI)**

2.11.11Elephant movement Pattern in ZOI / Add. ZOI:

The elephants / leopards from Satkosia Sanctuary / Tiger Reserve frequently enters into Handapa RF- Adjoining forests of Simuliapadar RF- Durgapur RF in the Western side – Nisha PF- Kuio PF- Kauchiakhol RF- Rakas RF – Kanheijena RF – To AnatapurRF in Dhenkanal District via elephant corridor crossing the River Brahmani. On the way they are crossing Rengali Right Canal and Left Canal, NH- 23 Canal.

2.11.12 Human- Wildlife Conflict (Depredation Data)

a) Crop damage: (Angul Division)

Year	No of cases	Area affected in Ac	Compassionate Grant in Rs	
			Sanctioned	Paid
2020-21	9186	1745.41	1,91,57,238/-	1,91,57,238/-
2021-22	6211	1397.71	1,52,26,528/-	1,52,66,390/-
2022-23	8098	1923.64	2,09,49,339/-	2,09,48,519/-
2023-24	11461	2542.502	3,77,29,000/-	3,77,29,371/-
2024-25(up to July 2024)	1175	233.659	1,11,64,285/-	2,09,52,192/-

Crop damage data (Angul Division)

b) House Damage:

Year	No of cases		Compassionate Grant Sanctioned & paid in Rs
	Part Damage	Full damage	
2020-21	15	72	7,50,000/-
2021-22	3	7	76,000/-
2022-23	26	44	4,94,820
2023-24	72	9	7,12,000/-
2024-25 (upto July 2024)	19	0	2,80,000/-

House damage (Angul Division)

C) Human Kill & Injury:

Year	No of cases			Compassionate Grant Sanctioned & paid in Rs
	Human Kill	Human Injury (Temp)	Human Injury (Permanent)	
2020-21	21	6	24	89,10,000/-
2021-22	10	2	13	52,90,000/-
2022-23	18	20	05	74,90,000/-
2023-24	20	13	7	1,47,15,000/-
2024-25 (upto July 2024)	5	0	0	24,60,000/-

Human kill & injury

D) Elephant Kill:

Year	Elephant Death (case no and Date)	Reason of Death
2020-21	3	Natural death
2021-22	7	Natural death (3nos), Electrocution (4no)
2022-23	3	Natural death (2nos), Electrocution (1no)
2023-24	2	Natural death (1no), Train hit(1no)
2024-25(up to July 2024)	4	Electrocution (2nos)& others (reason not known)

Elephant KIll

2.11.13 Public View on Man Animal Conflict:

Human- Wild Animal Conflict (HWC) is in a rising trend in this locality. Due to industrialization / Mining etc the Mega animal movement has been affected. The animal lovers are very much concerned about hostile attitude of public, depletion of wild animals in the region and remote possibility of striking a balance between Habitats- Developmental activities- Mining activities.

2.11.14 Other Projects within ZOI & their Impact Zone:

There are many Coal blocks in Talcher Coal field area. The habitat is completely destroyed by coal mining. The rail corridors developed / being developed completely blocked the animal movement.

2.11.15 Man-Animal Conflict:

Man animal conflict refers to negative interaction between wild animals and human beings such as crop raiding, human death and injury caused by wildlife and in retaliation (or otherwise) human beings killing the animals. Wildlife Management efforts raise conflict Issues not only through crop raiding, cattle lifting, property and life damage but also, generally when conservation comes into conflict with development. Both wildlife and people are in conflict and the goal is to enable coexistence and sharing of resources on sustainable scale. This is best achieved by addressing both sides of the equation.

The bear population is quite high in this area and the surrounding forests. A peculiar phenomenon is prevalent in this area. The sloth bear usually remains inside the forest during the winter months but comes out of its cover in search of Mahua flowers which is a delicacy for it. Normally in the winter mornings the environment remains full of fog and the bear has long fur on its eyebrows, which obstruct its vision.

Of late, another phenomenon has also troubled the local populace. Elephant herds have been reported to have occasionally crossed the area while moving from the Odisha Forests to the Elephant habitats down south. The local populaces have had their houses brought down and suffered a lot on account of these elephant movements.

2.11.16 Poaching/ Killing of animals:

While forest fires are usually unintentional and are in advertently due to carelessness, poaching is intentional and a crime of a very serious nature. Poaching is usually organized crime and there are tiers of different level of criminals involved in the racket. At the lowest level are usually the local people. There are certain tribes that are known to have been poachers for generations. They are usually the least benefited in terms of money that a serious poaching can accrue but without them usually poaching is not possible. The reason is simple, it's they who know the jungles well and its they who can walk long distances inside the forest and its they who use ingenious and usually difficult to trace methods like electrocution (by using a connection from overhead H.T. electrical transmission lines), poisoning (sometimes even large poisoning of water sources which shrink during the pinch period and a large number of animals can come to drink water from one water hole and get poisoned) and traps. The traps are sometimes very ingenious and entirely home made using small iron pieces and iron springs. These are usually so smartly hidden that they can be completely overlooked even by the people. The forest staff may have a real tough time in weeding out such traps.

Apart from the local people there is a whole chain that goes upright to the International level. This well-oiled system makes wildlife crimes very lucrative and International data Suggest that wildlife related crimes are only third after arms drugs related crimes in terms of money exchanged (WPSI-Wildlife Protection Society of Indian publication).

Nevertheless, poaching can be thwarted and the poachers brought to book but there is no short cut. It requires 24 hr monitoring of forest areas, particularly those that have relatively high biodiversity and where the number of animals is high.

2.11.17 Working Plan Prescriptions:

The present Working Plan of Angul Forest Division, valid from 2021-22 to 2030-31 consists of nine Working Circles as detailed below: -

- Improvement Working Circle
- Protection Working Circle
- Conservation and Maintenance of Soil and Water Resources
- Rehabilitation Working Circle
- Plantation Working Circle
- Bamboo (Overlapping) Working Circle
- Wildlife (Overlapping) Working Circle

The demand of the day is to manage the forest by active participation of local people (Joint Forest Management) on sharing basis. In the end for any felling takes place the stakeholders will have a 50% share. Only in Protection Management Working Circle this procedure has not been adopted as no felling is permitted. Therefore, thrust has been more on eco-development through strategies aimed at uplifting the local economy and also at increasing the general awareness of the local community about the importance of biodiversity and wildlife. When we plan for conservation of Wildlife in a forest area (and its neighboring Impact Area) that has to be diverted for a non-forest activity like coalmining, the task becomes rather peculiar because the question of usufruct sharing in case of Participatory Forest Management can only be addressed by the forest department and can certainly not go beyond the provisions of the Working Plans in force. What can be done though is a whole-hearted effort towards eco-development through uplifting of the local economy and also through enhancing the awareness level of the local community

about the need of biodiversity and Wildlife Management. The Conservation Plan would then focus towards awareness building of local people and also uplifting of local economy through capacity building and monetary support. While previously the whole emphasis used to be on exploitation of forests produce for economic gain, now a day the emphasis is more on protection, improvement and rehabilitation of the forests by treating the forests more as an ecosystem rather than as a timber factory. For our case we would discuss the Bio-diversity and Wildlife Management Management Circle in some detail in the paragraphs below.

2.11.18 Bio-diversity Conservation Management Circle:

The main objectives of this Biodiversity Conservation Management Circle as listed in the two Working Plans are outlined briefly below:

- Maintenance, Conservation and enhancement of Biodiversity
- Conservation and Maintenance of Soil and Water Resources

To meet these objectives, the following treatments are proposed in general:

- Wildlife Habitat Improvement by Enrichment Plantation which will include species suitable for wildlife in general and Elephant in particular.
- Priority would be given to engineering structures (Soil Moisture Conservation measures) for preventing soil erosion.
- Special Fire protection measures including fire lines and use of fire blowers.
- Provisions for saltlicks and water holes.
- Creation of Grasslands and meadows especially for herbivores.
- Studies on elephant habitat utilization by engaging Research Scholars.
- Bio-diversity assessment and monitoring by engaging Scientist and Research assistant.
- To create a Bio-diversity Park for nature lovers and student having Biology as a subject in their reading to identify the species, their phenology and area of distribution.

2.11.19 Wildlife Management:

Objectives and approaches of Wildlife Management:

- To improve the habitat of wildlife by reducing biotic interference caused in the form of illicit felling, poaching, grazing, and shifting cultivation, encroachment, overexploitation of timber and bamboos and forest fire, etc.
- Food, water, cover and space are the most important components of wildlife habitats.
- To conserve and preserve the diversity and integrity of flora and fauna within natural ecosystem.
- To carry out extensive as well as intensive research concerning to the improvement and development of wild habitat and wildlife.
- To educate the local inhabitants about the importance of wild fauna in the forest ecosystem.
- To conserve the existing prime wildlife habitats like the are as which are frequently visited by wild animals and birds for shelter, food, water, cover, etc. By providing adequate protection and by taking various developmental measures.
- To conserve and enhance the food availability in the natural areas as

  - Food is an essential prerequisite for wildlife habitat. Food availability in a habitat changes with the season. Herbivores depend on plant materials for their sustenance and normally selective feeders as their food preference are related to palatability.

  -Herbivores prefer the leaves, barks, twigs, flowers, fruits and seeds of their selective species. Wild elephants feed on barks and leaves of especially of Moraceae family. Deer, monkey, langur, hares feed on wild fruits. Among the plant materials, grass constitutes a major portion of the herbivores' foods.

  -Wildlife is basically divided into two broad groups i.e., Carnivores and herbivores. Carnivores prey on herbivores. The population growth of herbivores will increase the population of carnivores. Therefore, protection to forest is primefacily required. Besides, anti- depredation squad has to be deployed at vulnerable places in order to depredate elephant intervening to

human habitats and herbivores soling near the villages to quench their thirst during summer.

- To conserve the promote wildlife habitats-

  -Dead trees (snags) and stag headed trees are to be preserved for avi-fauna (wood picker) and reptiles like snakes and lizards to live and breed. Similarly, rookeries are to be preserved for mongoos to live and breed. Earthen mounts inside the forests are to be retained for bear and ratel that mainly depend on white ants.

2.11.20 Methodology:

The foresters, ranging from the forest guard to the Divisional Forest Officer (DFO) of Angul Division, will implement this conservation plan using their usual methods. The main goals of this plan are to provide guidelines for the management of the forest and wildlife in the Zone of Influence (ZoI) of the coal block area. These guidelines, known as the approved Working Plan, are mandatory for the foresters to follow. They apply to both the Core area, which includes the mining project, and the Buffer area, which extends 10 km from the periphery of the mining lease boundary.

2.11.21 Data Referred:

The following Data has been referred;

- Project Details including impact of mining.
- Locality factors including Climate, Geology, Hydrology and Ecology.
- Demography
- Forest and Wildlife related Chapters of Working Plan.
- Bio-diversity scenario.
- Survey of India Toposheets, Maps indicating mining area, surface map, forest maps of Angul district.
- Information about Plants species of medicinal and economic importance.
- Information about rare and endangered plants and animals.
- Information about Wildlife census and Poaching.
- Information about Compensation paid to victims due to Wildlife-Human interface.
- Present forest management practices and Working Plan prescriptions.
- Present Wildlife management in the area as depicted in the Working Plan (Wildlife overlapping Working Circle).

CHAPTER-3

IMPACTS OF THE PROJECT

CHAPTER-3- IMPACTS OF THE PROJRCT

Project Impacts on Environment

Mining operations often have significant environmental consequences that can extend beyond the immediate mining areas. It has become increasingly important and necessary to assess the environmental and health impacts of mining operations. The emission of particulate matter, Sulphur Dioxide (SO_2), and nitrogen oxides (NOX) from mining activities contribute to air pollution, posing health risks to the population exposed to it. In order to gather essential information, environmental baseline data has been collected from October 2022 to December 2022 for both the project site and a 10 km Zone of Influence (ZoI).

The project's Impact Area, which spans a radius of 10 km, has undergone an assessment of its environmental base line. In order to identify environmentally sensitive areas within the study area, a preliminary reconnaissance survey was conducted. The collection of environmental base line data involved primary surveys, literature surveys, and discussions with relevant departments and agencies.

3.1 Possible Impacts:

The Environmental Impact Assessment study has provided a comprehensive description of the potential effects on the Human population, Flora & Fauna. The Environment Management Plan has established general principles and protective measures to mitigate these effects. However, there are specific impacts on flora and fauna that require detailed attention within this plan. The project area and project impact area are expected to experience the following impacts.

3.2 Impact on Soil:

Top Soil:

The ore and waste rock surfaces are covered by topsoil, which will be removed for ore excavation. The thickness of the topsoil varies depending on the location, ranging from none on exposed outcrops and steep slopes to depressions. During the initial development of the mine and subsequently, the topsoil and alluvium will be separately removed and stored in a dump for future use before planting. A significant portion of the forest land will be affected by the mining pit, with a safety zone set aside. As a result, soil erosion may occur, leading to the formation of gullies and ravines, which can further damage the forest and wildlife habitat. The possibility of landslides cannot be ignored.

3.3 Over burden:

The estimated mineable coal reserve within the specified mine boundaries is 768.83 million tonnes (Mt), accompanied by an in-situ overburden of 613.18 million cubic meters (Mcum). The overburden consists of various components such as top overburden, parting between seams, ungraded coal, bands thicker than 1 meter, and coal seams less than 1 meter. The process involves re-handling 103.72 Mcum of in-situ equivalent overburden. The total handling of overburden, including the re-handled portion, amounts to 716.90 Mcum. The overall stripping ratio for in-situ overburden is 0.80 cubic meters per tonne (cum/t), and when considering re-handling, it becomes 0.93 cum/t.

3.4 Impact on Vegetation:

As the mining excavation progresses, the vegetation in the area, including trees, shrubs, herbs/climbers, grasses, and medicinal plants, will gradually vanish. Additionally, the influx of labor force may result in a sudden increase in the demand for small timber and firewood, which will further intensify the biotic pressure on the surrounding forests. Consequently, this will lead to the destruction of more forests within the impacted area, resulting in a decline in both the quantity and quality of flora.

3.5 Reduction in wildlife habitats due to diversion of forest area:

During the lifespan of the mine, a total of 125.24 hectares of forest land will be devastated as a result of mining activities. The forests within the mining zone will be completely destroyed, depriving wild animals of their natural habitat. Consequently, the reduction in wildlife habitat will be significant. Additionally, the biotic pressure that was previously absorbed by the forests in this area will now be transferred to the adjacent forest areas within the impact zone. Consequently, the forests in the impact area will face even more depletion.

3.6 Impact on flora and fauna in general:

The vegetation in the designated project area will suffer extensive destruction, with the exception of the safety zone. Furthermore, even the areas allocated for plantation will not be immediately accessible to wild animals. The desiccation resulting from the excavation of large mine pits may also lead to the destruction of vegetation surrounding these pits.

In this particular region, the requirement for fuel wood is relatively low in both the project area and the impact zone due to the presence of coal. However, other needs like cattle grazing, gathering non-timber forest products (NTFP), collecting small timber, and obtaining building

materials have to be fulfilled from the forest areas within the impact zone. This additional pressure will contribute to the further deterioration of the surrounding Reserve Forests, especially within the impact zone.

The risks to wild animals can be categorized as follows:

1. Direct Threat
2. Indirect Threat

- The direct endangerment of wildlife occurs through the killing and hunting of wild animals for various purposes, including the collection of wild meat/ bush meat. Additionally, the movement of a significant number of vehicles, machinery, and equipment can lead to accidental killings. Forest fires also present a direct threat, as they result in the trapping and killing of numerous small and medium-sized animals. In some cases, even large animals become trapped in these fires.
- The shrinkage and degradation of habitat, as well as the scarcity of food and water, contribute to the indirect threat. The majority of conflicts between humans and animals occur as a result of this indirect threat. Angul district is home to numerous coal blocks that are currently in operation. Therefore, it is crucial for us to redirect our attention towards areas located outside the Coalzone.

3.7 Impact on Water Regime:

3.7.1 Impact on Water quantity/ Loss of Moisture:

Due to mining activities, there will be a notable increase in evaporation from the exposed soil, resulting in a decline in its moisture retention capacity. This will lead to the drying out of the soil, which can further harm the nearby vegetation. Moreover, the underground water in the surrounding area will also be depleted. The process of removing water and releasing large quantities into the natural drainage system may contribute to a reduction in both underground water and groundwater, thereby worsening the problem of water scarcity. As a result of the excavation process, a substantial amount of water will accumulate in the mine pits. This will inevitably attract wild animals, potentially causing them to become trapped in the pits, which could have fatal consequences for them.

3.7.2 Water accumulation:

3.7.3 Water pollution:

The Singhada Jhor, a perennial nala, flows from west to east along the northern boundary of the project area, serving as the main natural drainage line for the project. The water, along with slurry, will be extracted from the mine pit and discharged into the natural drainage system. There are several ponds and wells located throughout the property. A small reservoir to the south is depicted on the topographical map, which is primarily used for irrigation purposes. However, it is important to note that the water source within the mining area may be muddy due to the presence of a significant amount of dust and soil particles. Additionally, there is a possibility of oily substances being released from various machinery and vehicles, which could further contaminate the water in the mine area. Moreover, the local water source is also at risk of contamination due to the frequent use and cleaning of heavy vehicles and machinery. The utilization of slurry pumps for dewatering and the subsequent release of water, along with slurry, into the natural drainage system will result in the contamination of the natural streams, posing health hazards for both the human population and animals.

3.8 Impact on Air:

3.8.1 Air pollution:

In a semi mechanized opencast mine, various mining operations such as extraction, loading and unloading, movement of dumpers on haul roads, and external dumping and sizing of ore are anticipated to produce fugitive dusts that become airborne. The current concentration of SO_2 and NOx in the proposed core zone area is consistently below 10 $\mu g/m^3$ in all recorded measurements. However, there is an expectation of relatively higher levels of SPM and RPM due to the presence of fine particles that easily become airborne after blasting and on haul roads. The high specific gravity of the ore mitigates the generation of dust to a certain extent. Nevertheless, the excavation waste will contribute to an increase in airborne dust levels to some degree.

The mining process will generate large amount of dust. The activities which produce dust are:

- Drlling, blasting, excavation and transportation of overburden;
- Drilling, blasting, excavation and transportation of coal;
- Construction and demolition activities like construction of workshop, Coal Handling Plants, land cleaning, handling of debries and materials, etc.
- Loading, unloading of coal and movement of vehicles and equipments;
- Wind erosion;
- Movement of vehicles on haul roads at the time of transportation of coal and over burden.

- Grinding and crushing of coal.

The grinding process and internal transportation of coal powders, whether through conveyer belts or other means, as well as the unloading and reloading procedures, will result in the dispersion of a significant quantity of dust along with the coal powder. The combination of this dust and coal powder has the potential to contribute to air pollution, which in turn can lead to respiratory issues in wildlife. Moreover, the substantial amount of dust and coal powder settling on grasses and other fodder plants renders them unsuitable for consumption. Consequently, when animals consume these contaminated fodders, it can result in digestive problems.

3.9 Noise Pollution:

The operation of heavy machinery and blasting activities in the mining area result in the emission of a significant amount of noise, which can potentially disrupt the natural habitat of wild animals. The movement of numerous heavy vehicles in and around the lease area further exacerbates this disturbance, causing panic within the Zone of Influence. As a result, wild animals will actively avoid areas frequented by heavy vehicles, rendering these regions inaccessible to them.

3.10 Quantum of Pollutants:

Given that the project is centered around a Coal mine, the predominant pollutants consist of dust combined with coal powder. Without implementing appropriate measures, a substantial amount of dust is likely to be produced during the operation. The mining activities, movement of a significant workforce and vehicles within the mining area, and the establishment of a residential colony will result in the generation of a considerable quantity of waste within the mining vicinity. Alongside the overburden generated during the process, there will also be a substantial production of pollutants, including bio-degradable waste that, if not handled properly, can act as pollutants, as well as hazardous waste such as used oil, used batteries, and filter materials containing oil. It is expected that the mining process will generate the following types of hazardous waste.

1. Used Batteries,
2. Used Oil and Greese,
3. Oily sludge,
4. Filter and filter materials.
5. Laminated Packing material sand polythene packets,
6. Spare parts, nails, etc.

The consumption of food contaminated with poisonous used batteries can be fatal. Additionally, the use of used oil and oil emulsion can harm plants and contaminate water sources. These hazardous substances pose a threat to the environment, including water and soil pollution, and can lead to various health issues for both human and animal populations, including wild animals.

3.11 Degradation Anticipated:

Physiographic change of the habitat: Large pits will be excavated for the mining activity. However, certain sections or some of the pits can be filled with overburden and topsoil, which will be stored separately according to the mine closure plan. Nevertheless, these materials will not be sufficient to backfill all the pits. As a result, the original physiography of the area will be altered, thereby disrupting the existing wildlife habitat. The Zone of Influence contains numerous Forests blocks and several Forest kissam Land. The mining operation will inevitably cause some disturbance in the surrounding area, especially within the Reserved Forests located in the Impact Zone.

3.12 Destruction of Wildlife Habitat:

As a result of mining operations within the leased area, the biotic pressure previously exerted on the lease area will be transferred to the surrounding regions. The local community's collection of fuel wood, small timber, and other non-timber forest products (NTFP) will also be redirected to the surrounding area, leading to increased pressure on the adjacent forested land. Additionally, the grazing activities of local cattle will be shifted to these forests, further intensifying the biotic pressure. Consequently, these forested areas will experience additional strain, potentially disrupting the wildlife habitat within them.

3.13 Probable increase in the vehicular traffic:

The mining process is completely automated. Numerous machinery and vehicles will be utilized for the project's operation.

Table-3.1: Configuration of Equipments and Vehicles

Sl no	Particulars	Capacity	No. of equipment
HEMM			
Overburden:			
1.	Hydraulic shovel	10-11cu.m.	5
2.	Hydraulic shovel	6-7cum	6
3.	Rear Dumper	100T	40

Sl no	Particulars	Capacity	No. of equipment
4.	Rear Dumper	60T	76
5.	Drill	250mm	9
6.	Drill	160mm	14
HEMM			
7.	Dozer	410HP	2
8.	Crawler Dozer with Ripper	850HP	10
9.	Crawler Dozer	410HP	6
Coal (OCP)			
1.	Surface Miner	50tclass	7
2.	Front End Loader	5-7m3	7
3.	Wheel Dozer	450HP	4
4.	Rear Dumper	60T	39
Common			
1.	Rough Terrain Crane	75T	3
2.	Tyre Mounted Telescopic	25T	5
3.	Pick-n-Carry Crane	10T	4
4.	Fork Lift Truck	5T	4
5.	Water Sprinkler	28Kl	15
6.	Diesel Hyd. Backhoe	1.5cum	2
7.	Truck Mounted Mobile Crane/Atomizer	-	4
8.	Tyre Handler for upto 100T	--	2
9.	Vibratory Compactor	10T	4
10.	Motor Grader	280HP	4
11.	Maintenance Van	150HP	2
12.	Fire Tender	14KL	2
13.	Fuel Bowser	20 KL	4

CHAPTER-4

MITIGATION MEASURES

CHAPTER-4-MITIGATION MEASURES

The mining purpose necessitates the diversion of 125.24 hectares of forest area within the project site. Numerous other mining projects are currently in operation or have been approved in the vicinity, which means that the impact of this project could extend beyond the boundaries of the other mining areas. Consequently, there is a high probability of an increased congregation of wild animals within the surrounding forest areas. As a result, these animals will become more vulnerable to various threats. Hence, the primary objective of the Management Plan is to mitigate and minimize these potential risks.

The Divisional Forest Officer will implement various interventions within the project impact area, which extends beyond the project boundary by approximately 10 kilometers. These interventions will encompass enhancing the habitat, implementing measures to mitigate conflicts between humans and animals, and facilitating the movement of large wildlife across man-made linear infrastructures that obstruct their natural movement.

The Plan prescribes certain control measures for conservation of Flora & Fauna. These are:

- Enhancement of vegetal cover through biological reclamation, arboriculture/afforestation,greenbelt/ avenue plantation.
- Creation of water holes.
- Zero discharge or release of treated water.
- Mass afforestation within the zone of Impact.

The aforementioned measures are merely recommendations, as there is no specific plan in place. This consideration is taken into account when formulating the present Wildlife Management Plan. Taking into consideration the potential risks to wildlife outlined in the previous chapter, the Management Plan is designed to tackle nearly all of these threats. Both the mining area and the Impact Zone will undergo habitat enhancement to ensure a greater availability of food and water for the wild animals. The proposed measures for mitigation are outlined below:

4.1 Habitat Improvement

The enhancement of the wildlife habitat within the Impact Zone is being suggested through the implementation of the following initiatives:

4.2 Safe passage to Existing Wild-life

It is crucial to preserve the current population of wild animals in the lease area and relocate them to safer habitats. This goal can be accomplished by initiating mining operations in areas that are distant from the forested regions, thus enabling these animals to migrate to the adjacent forest areas, specifically near Durgapur RF. The Zone of Influence encompasses numerous Reserved Forests, providing ample opportunities for the wild animals in the lease area to find their way to nearby forested areas.

4.3 Restoration of habitats

Restoration of habitat will be carried out gradually within the project area, alongside the mining activity. By the time the mine is closed, a significant portion of the project area will have been transformed into a suitable habitat. As part of the conceptual phase, the 182.52 hectares of backfilled area will be utilized for the green belt development program, while 11.79 hectares of the safety zone area will be dedicated to plantation from the base year. Following the standard plantation norm of 2500 seedlings per hectare, a total of 485,775 seedlings are proposed to be planted during the conceptual period. The safety zone area is located around the mine pits and will serve as a green belt, preventing the spread of dust and coal powder. Additionally, it will act as a buffer zone between the mine and the wildlife habitat. These plantations are already included in the mining plan, so no additional funds are required for this purpose.

4.4 Soil and water conservation

Due to the extensive excavation of mining operations, a significant loss of moisture is expected, along with extensive soil erosion. The majority of the allocated area will be used for mining, excluding the safety zone where the rainfall will be directed to settling tanks through gentle gradient channels to minimize soil erosion. This arrangement is included in both the Mining Plan and the Environment Management Plan, eliminating the need for separate provisions. To mitigate high soil erosion rates, the planting of trees and grass will stabilize the overburden dumps, as outlined in the Mining Plan. Therefore, no additional provisions are necessary in this plan.

4.5 Control of Dust

The extraction procedure entails the emission of substantial amounts of particulate matter, resulting in air contamination that profoundly affects both individuals and laborers engaged in mining operations. Moreover, this particulate matter presents difficulties for the local fauna. As a result, the management of dust becomes an essential component of the mining process. Although

it is unfeasible to entirely eradicate dust generation, endeavors are undertaken to reduce the quantity of dust generated during mining activities. Diverse measures are implemented to accomplish efficient dust control.

- The drills are provided with well-designed dust extraction/suppression system. Wherever necessary, wet drilling will be taken up.
- Blasting operation designed to produce minimum dust;
- Use of optimum amount of explosive so as to produce minimum dust.
- Use of sprinklers and dust suppression units at the time of loading, transportation and handling of coal and over burden. Mobile water sprinklers and mobile Tankers will bedeployedintheprojectareawherevernecessaryparticularlyinthecoalstorageyard.
- Dust extraction/suppression system installed in coal handling plant through mist formation system and sprinklers at all transfer points as well as surrounding areas.
- Black topping of haul roads and regular maintenance is done.
- Regular maintenance of HEMMs and P&M.
- Deployment of Surface Miners where, dust generation is controlled by water sprinkling and the process of drilling, blasting and crushing are eliminated.
- Green belt provided around the quarry, workshop complex and a venue plantation taken up along haul roads and other roads.
- Provision of adequate fire-fighting arrangements.
- Dust control measures have been proposed as compliance to Environmental ImpactAssessment and therefore special provision is not made for this.

4.6 Control of water pollution

Water pollution plays a crucial role in coal mining as it is the most significant factor. Each day, a substantial amount of water is produced along with slurry, which needs to be extracted from the mining pits. Moreover, the cleaning of vehicles and machinery, as well as the disposal of waste, contribute to the generation of large quantities of contaminated water. To mitigate water pollution, it is essential to treat the water before releasing it into the natural drainage system. The discharged water will be collected in sump pits and directed towards a sedimentation pond and an effluent treatment plant. The treated water will then be utilized for dust suppression on haul roads, washing dumpers and dozers, and other similar purposes. To effectively control water pollution, the following measures will be implemented:

- Waste water generated in the workshop and vehicle servicing/ machinery servicing units is channeled through oil & grease tap and settling tanks.
- Provision of septic tanks, soak pits and Sewage Treatment plant installed for domestic effluents.
- Mined is charge water is treated and re-used.
- Garland drains provided around OB dumps and the water channeled through settling tanks.
- Regular monitoring is done and corrective steps taken when required.
- Oil and Grease recovered manually will be stored in drums and auctioned.

The Environment Management Plan includes the implementation of various measures to address surface runoff. Sedimentation ponds will be utilized to allow the settling of suspended materials, while garland drains will help channel the runoff. Any excess water will be redirected to the natural drainage system. As these measures are already outlined in the plan, no additional provisions are necessary.

4.7 Noise control

The subsequent actions will be implemented to ensure that the noise is maintained at the lowest feasible level:

- The effective design of plant and machinery involves incorporating built-in mechanisms such as silencers, mufflers, and enclosures for noise-producing components, as well as utilizing shock-absorbing pads at the foundation of vibrating equipments.
- Silencers provided where necessary.
- Routine maintenance of equipments,
- Enclosures for crusher house, etc.
- Rational deployment of noise generating plant and machinery.
- Greenbelts are created around the quarry infrastructure sites, service building areaand avenue plantation along the haul roads to absorb Noise.
- HEMMs are installed /kept with sound proof cabins.
- Chute linings in Coal Handling Plant.
- Provision of isolation for vibrating equipments (both fixed and mobile).
- Major portion of coal production is achieved by deployment of eco-friendly surface miners, which eliminates the process of drilling, blasting and crushing, and reduces noise & dust generation.

- Wherever blasting is required the same is restricted to a particular time during the day (preferably shift change time) so as to cause minimum panic to wild animals. Night blasting if avoided.
- Regular monitoring of noise levels at various points.

4.8 Lighting

The mining activity's central region is adequately lit, preventing animals from entering the hazardous mining area. The use of vehicle headlights, which disturb the animals, is limited, and only dippers are permitted within the mining site. These practices have been incorporated into the mining process, eliminating the need for additional funding.

4.9 Overburden Management

The top soi land other mine waste constitute the over burden. These materials are stored separately for back filling of mine pits as per mine closure plan. The OB dumps are surrounded by retaining walls followed by Garland drains. Washing away of the top soil is controlled by providing retaining wall around the dump and adopting dump stabilization methods. The backfilled area will be technically and biologically reclaimed. The steps taken in this regard are as follows:

- Overburden is dumped at designated location.
- Loose soil and Over burden are promptly lifted to the designated location.
- Proper Terracing is done keeping in view the angle of Repose.
- Dump stabilization is done by planting ff grasses and other suitable species.
- The dumps are surrounded by retaining walls to control washing away of soil.
- Garland drains are provided around the retaining walls leading to settling tanks, to settle the washed away soil/silt etc.
- Check dams provided along the natural drainage system to control soil erosion.

4.10 Garbage Management

Since Garbage not only creates problems for the wild life but also creates problems for mining activity. Particularly non-degradable materials like polythene bags etc. pose a lot of problem forth machineries as well as Wild animals. Hence proper garbage management is also an important activity in mining process. Some of the steps to be taken within the mining area have

been indicated under water pollution. The additional steps which are to be taken for Garbage management are as follows.

1) Entry of non-biodegradable materials which are likely to produce garbage such as polythene bags, aluminum foils, tin foils, etc. are restricted in to the Mining area.
2) Un-avoidable generation of hazardous materials such as used batteries, used oils, parts of machineries and equipments are promptly collected and kept at secluded places for disposal.
   i. There will be generation of large number of used batteries. These batteries will be kept in store and put to Auction sale every year.
   ii. Similarly, large quantities of used oil will be generated. This oil will be stored in drums and auctioned annually.
   iii. There will also be generation of huge quantities of Oily sludge from oil & grease trap as well as substantial quantities of filter materials. These materials will be disposed in pits lined with impervious layers.
3) The Garbage generated in the Mining area is regularly collected and segregated in-to Bio-degradable and non-degradable materials.
4) The non-degradable materials if any are sent for recycling.
5) The Bio-degradable substances are put in the Compost pits for conversion in-to manure. The Manure obtained from these pits will be utilized for plantation purpose.
6) Garbage management is an important activity as per provisions of Environmental Management Plan. Hence no separate provision is made for this.

4.11 Fall of animals in the mining pits

In order to prevent accidental fall of animals in the mine pits the following steps shall be taken.

- The Executives and the Supervising staff will be educated and motivated to collect information regarding presence of wild animals in the mining area. In case any such animal is noticed it will be driven away to the nearest forest.
- There will be large scale activities within the mining area and it will be sufficiently illuminated with bright light so that the wild animals will avoid the area.
- It is also proposed to install Solar Electric fencing over 10 km to prevent animals from entering the project area.

- In-spite of the precautions taken, in case of accidental fall of any wild animal in the mining pit, the workers will be educated to inform the local Forest authorities and act as per their advice.

4.12 Free distribution of Seedlings

To enhance the vegetal cover in the vicinity of the project site, a specific quantity of seedlings/ saplings will be provided to the residents residing in the neighboring villages. The distribution will consist of an equal number of teak seedlings/ saplings and grafted seedlings/ saplings of fruit-bearing plants.

4.13 Provision of Vehicle

One vehicle will be provided to the Forest Department for protection and monitoring of forest area and wildlife.

4.14 Provision of Equipments

Certain equipments such as Computers, Camera traps, Night vision equipments, GPS/DGPS, etc. as per the requirement of the Forest Department will be supplied.

4.15 Exposure visit of Staff and VSS members

The Forest Department personnel, along with the VSS members, will embark on educational trips both within and outside the state to enhance their understanding of forest and wildlife conservation. These excursions will primarily concentrate on the conservation of the Elephant.

4.16 Awareness activities on conservation of wildlife by project proponent

The nearby villages will be extensively educated about the importance of wildlife conservation and their ecological roles. They will be instructed to appreciate the value of wildlife, maintain a safe distance from them, and effectively handle any conflicts that may arise. The villagers will receive training on the general behavior, preferred habitat, and food choices of wildlife. It is expected that the villagers will undergo a behavioral change based on the aforementioned points. The awareness campaign will ensure that all villagers understand the significance of wildlife and refrain from engaging in any criminal activities against animals and forests. This awareness will be disseminated through popular lectures, film screenings, and the recognition and rewarding of eco-friendly villagers. The responsible agency will take proactive measures to create awareness in the villages surrounding the mining area. The following activities will be implemented as part

of the awareness generation initiative: distribution of informative leaflets, organizing essay writing, debate, and drawing competitions in schools and colleges, staging street plays and Nukad Natak, celebrating important days related to wildlife conservation, conducting training sessions, boosting awareness through social media platforms, and creating informational pamphlets.

4.17 Immunization/ vaccenation of Livestock through organizing camps by project proponent

A significant number of domestic cattle reside in the region and exert immense grazing pressure on the natural vegetation. They frequently visit the forested areas where various herbivores, which serve as the primary food source for large carnivores, also inhabit. These cattle are often susceptible to FMD (Foot and Mouth disease). When they graze in the forested areas, there is a higher likelihood of disease transmission from cattle to wild herbivores. To address this issue, the cattle will receive regular immunization against F.M.D (Foot and Mouth Disease) to prevent the spread of diseases carried by cattle in the forest and their impact on the wild animals. The project proponent will endeavor to minimize the risk of disease transmission from domestic cattle to wild animals by organizing vaccination and immunization camps for domestic cattle.

4.18 Improvement of feed and drinking water facilities in Durgapur RF, Malibandha RF and Jaipur RF

-Conservation of elephants' preferred food plants, such as grasses, palms, liana vines, fast-growing trees, and water sources, elephants will be restricted to their forest home up to some extent.

-Early warning bulk SMS Alerts along with pulsating warning lights on towers that warn of Elephant presence in mine lease boundary areas will be developed.

-A Community-based-conflict-management (CBCM) measure, as a means of empowering the community to share the responsibility of human-animal conflict mitigation with the Forest Department will be ensured through JFMC/ EDC/ Gram Sabha considering their vital stake and eliciting more rapid response. Community and farmer groups will be engaged to ensure that besides preventive measures, traditional crop-guarding methods are encouraged, with the involvement of the local community/ farmers. A compendium on good practices on crop guarding techniques will be developed for use by the local community with the help of the forest department.

4.19 Nourishment/ strengthening of source habitats (Satkosia Tiger Reserve and Mahanadi Elephant Reserve) for keystone species; Elephant & Tiger

According to the elephant census report of 2012 and 2017, the Angul Forest Division recorded sightings of 56 and 45 elephants respectively. As per elephant censuss report 2024 recorded sightings 119 nos of elephant. This year, there has been a remarkable increase in the elephant population, estimated to be between 140-300 individuals. The Satkosia Tiger Reserve and Mahanadi Elephant Reserve serve as crucial habitats for both elephants and tigers in this region.

4.20 Species-specific Wildlife Management Plan for Elephant

The study area primarily focuses on the conservation of the Elephant, making it the species of utmost concern. Consequently, a distinct conservation strategy has been devised specifically for elephants, placing emphasis on rescue, release, and anti-depredation efforts.

Table 4.1: Specific Conservation Plan for Elephant

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Order:	Proboscidea
Family:	Elephantidae
Genus:	*Elephas*
Species:	***Elephas maximus***

Name	Habitat	Ecology and Behaviour	Threats	Conservation Strategies
Asian Elephant (*Elephas maximus indicus*)	Asian elephants inhabit grasslands, tropical evergreen forests, semi-evergreen forests, moist deciduous forests, dry deciduous forests and dry thorn forests, in addition to cultivated and secondary forests and scrublands.	Asian elephants are crepuscular, mega herbivores having a diet up to 150 kg per day. They are known to feed on more than 100 different plant species including most commonly of the order Malvales, as well as the legume, palm, sedge and true grass families. They drink at least once a day and need plenty water for bathing that's why they never move far from a permanent source of fresh water. Cows and calves move about together as groups, while bulls disperse from their mothers upon reaching adolescence. They produce three basic sounds: growls, squeaks and snorts. Growls are used for short distance communication; squeaks come in two forms; chirpings and trumpets. Chirping consists of multiple short squeaks and signal conflict and nervousness whereas trumpets are lengthened squeaks with increased loudness and produced during extreme arousal. Snorts signal changes in activity and increase in loudness during mild or strong arousal.	Loss, degradation and fragmentation of its habitat are the major threats associated with this animal, which leads to increasing conflicts between humans and elephants. Poaching for ivory and a variety of other products including meat and leather are the other prominent threats.	The individuals residing in the neighboring regions and the staff members of the mining corporation would be incentivized to safeguard the elephant. Despite the fact that the elephant has not been observed or reported within the mining site in recent times, its existence and mobility have been verified in previous years. Hence, the subsequent approaches will be implemented to preserve this majestic creature: -The priority will be given to the habitat improvement program, which involves planting various plant species mentioned in the green belt development program. Local species preferred by the elephant, as discussed in the previous chapter of this document, will be emphasized. In order to enhance the natural areas, grasses and saplings of tree species will be distributed to the villagers for planting. -Conservation of bathing sites and Increase knowledge base on elephants and their habitat conservation and reduce human-animal conflict through awareness campaigns in nearby villages. -One-time grant for monitoring elephant numbers, population trends, and threats to elephants and their habitats within the study area. -Habitat improvement activities (enriching soil,

				water, vegetal cover, etc.) will be ensured to enhance the food density in the study area. -There will be a provision of elephant depredation squad, gajraj vahan and other suitable vehicles and equipments for safety and rescue of the animal. -Creation of various physical barriers like Elephant Proof Trench (EPT), removable barriers, spike walls, solar fencing, tentacle fencing, and biological fencing wherever required. -A provision of acoustic deterrence's and farm based deterrence like flash light, spot light, flickering light, etc. -Constitution of Hathi-Mitra dal in affected villages and trained them for the purpose of conservation of the species.

4.21 MINE CLOSURE PLAN

The mine closure plan is one of the most important requirements in the environmental management of mining projects. The closure operation is a continuous series of activities right from the commencement to decommissioning of the project. Therefore, the progressive mine closure plan is specifically included in the mining plan. The primary aim is to ensure that the following broad objectives along with the abandonment of the mine can be successfully achieved:

- Creation of a productive and sustainable after-use for the site, acceptable to mine owners, regulatory agencies, and most importantly to the community.
- Protection of public health and safety of the surrounding habitation.
- Minimization of environmental damage.
- Conservation of valuable attributes and aesthetics.
- Counter balancing the adverse socioeconomic impacts.

Some of the activities which will be undertaken as per the Approved Mining Plan are as follows.

1) Land Degradation and Restoration.
2) Existing Water Bodies – Diversions.
3) Post Closure Water Quality Management
4) Post Closure Air Quality Management
5) Waste Management
6) Top Soil Management
7) Management of Coal Rejects.
8) Restoration of Land used for Infrastructure
9) Disposal of Mining Machinery.
10) Safety & Security.
11) Abandonment Cost & Financial Assurances.
    a) Cost of Activities to be taken up for closure of the mine – Rs 693.54 Crores.
    b) Amount to be deposited in Escrow account – Rs 277.82 Crores

4.22 Post Mining Land Use

During post mining stage, the excavated mining area will be partly backfilled from the existing waste dumps prevailing over the lease at the time to restore the natural profile. The back fill will be properly graded & terraced and will be biologically reclaimed by the coir matting and plantation. The post mining land use thereafter is given below:

Table 4.1: Proposed and Post Closure Land use of Project

	Land use (Proposed)	Lind Use (End of life)	Land Use (Post Closure)						
			Agricultural	Plantation	Water Body	Public /Company Use	Forest Land (Returned)	Unplanted	Total
Excavation Area	881.28	881.28	0	0	0	0	0	0	
Backfilled Area	715.24	715.24	495.27	182.52	0	0	37.45	0	715.24
Excavated Void Without Plantation	130.68	130.68	0	0	0	0	0	130.68	130.68
Water harvesting	35.36	35.36	0	0	35.36	0	0	0	35.36
Top Soil Dump	8.97	8.97	8.97	0	0	0	0	0	8.97
Coal Stock Yard	9.76	9.76	9.76	0	0	0	0	0	9.76
External Dump	24.17	24.17	24.17	0	0	0	0	0	24.17
Safety Zone	11.79	11.79	0	11.79	0	0	0	0	11.79
Haul Road between quarries	Nil	Nil	0	0	0	0	0	0	Nil
Road diversion	NIL	NIL	0	0	0	0	0	0	NIL
Nala Divulsion & Selling Pond	8.42	8.42	0	0	0	8.42	0	0	8.42
Roads, buildings	Road: 15.72	Road: 15.72	0	0	0	15.72	0	0	**118.16**
Infrastructure, Sub-	Township: 27.12	Township: 27.12	0	1.26	0	25.86	0	0	

	Land use (Proposed)	Lind Use (End of life)	Land Use (Post Closure)						
			Agricultural	Plantation	Water Body	Public /Company Use	Forest Land (Returned)	Unplanted	Total
total	Infra: 75.32	Infra: 75.32	0	0	0	0	75.32	0	
	118.16	**118.16**	0	0	0	0	0	0	
Rationalization	25.34	25.34	0	25.34	0	0	0	0	25.34
Garland drains	Negligible	Negligible	0	0	0	0	0	0	0
Embankment	11.49	11.49	0	0	0	11.49	0	0	11.49
Green Belt	6.89	6.89	0	0	0	0	6.89	0	6.89
Explosive mag.	5.58	5.58	0	0	0	0	5.58	0	5.58
Total	**1111.85**	**1111.85**	**538.17**	**220.91**	**35.36**	**61.49**	**125.24**	**130.68**	**1111.85**

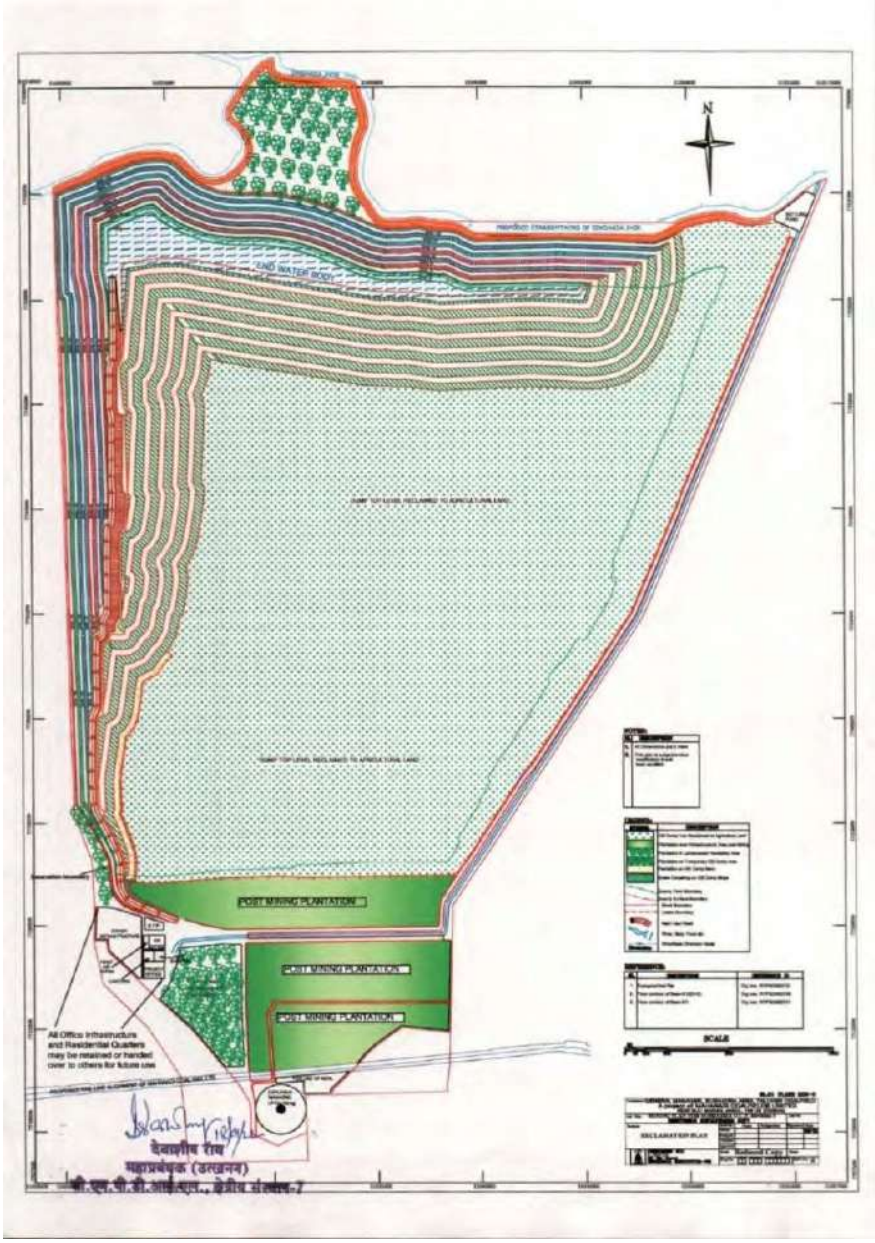


Fig. 4.1. Layout of Post Mining Land Use Plan

4.23 Disturbance in the connectivity between different RFs:

The immediate vicinity of the lease mine area is home to three notable forests: Durgapur RF in the South-West, Malibandha RF in the South-East, and Jaipur RF in the North. It might be possible that the mine lease area, being a large land parcel, serves as a connecting pathway for elephants between these Reserved forests. In the event of such a circumstance, the diversion of this land parcel for mining endeavors could potentially pose obstacles to the

movement of elephants between these forests. This particular situation could lead to the elephants having to undertake extensive journeys, thereby presenting new challenges in terms of human-elephant conflicts.

Moreover, various animals that have wide home range and reported/ recorded near forests sharing boundries of project can be affected by mining activities by restricting their movemet from one forest area to another.

Table 4.2: List of animal species found in the forest sharing boundries of the project

Sl. No.	Common Name	Scientific Name	Schedule as per IWPA, 1972	Conservation Status as per IUCN	Schedule as per IWPA, 2022
1	Spotted Deer	*Axis axis*	III	LC	II
2	Barking Deer	*Muntiacus muntjak*	III	LC	II
3	Common Fox	*Vulpes bengalensis*	II	LC	I
4	Five striped Palm squirrel	*Funambulus pennanti*	IV	LC	II
5	Hedgehog	*Paraechinus micropus*	IV	LC	II
6	India Langoor	*Semnopithecus sp*	II	LC	II
7	Indian Civet	*Viverricula indica*	II	LC	I
8	Indian Elephant*	*Elephas maximus*	I	EN	I
9	Indian Field Mouse	*Mus booduga*	V	LC	-
10	Indian Porcupine	*Hystrix indica*	IV	LC	I
11	Jackal	*Canis aureus*	II	LC	I
12	Mongoose	*Herpestres edwardsii*	IV	LC	I
13	Musk Shrew	*Suncus murinus*	-	LC	-
14	Rhesus Macaque	*Macaca mulatta*	II	LC	II
15	Sambhar	*Cervus unicolor*	III	VU	I
16	Short Nosed Fruit Bat	*Cynopterus sphinx*	V	LC	II
17	Wild Boar	*Sus scorfa*	III	LC	II
18	Wild Cat	*Felis chaus*	II	LC	I

*Last recorded at boundary sharing with Jaipur RF in the year of 2018/ LC- Least Concern, EN- Endangered, VU- Vulnerable

Table 4.3 The measures for mitigation to be done by Angul Forest Division

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
A	**Habitat Improvement**					
1	Weed eradication (30 Mandays) and Sowing of seeds (10 Mandays) in the zone of Impact for the rejuvenation and restoration of the Elephant Habitat. 40 Mandays (40x450/-= 18000/-)per ha.	0.180	500	ha	90	Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF, etc. In the zone of impact and the elephant movement area of the Angul Forest Division. 100 ha per year
2	Creation of Water Body	10.00	2	Nos.	20	In the zone of impact and the elephant movement area of the Angul Forest Division.
3	Miyawaki plantations in small blank patches of the degraded forests coming within the elephant habitat for the quick restoration & rejuvenation. (Miyawaki Plantation 5 ha during 1st year Rs.192.375lakhs and 5 ha during 2nd year including maintenance Rs.245.833 lakhs, 2nd and 3rd Maint. Rs.86.051 lakhs, 3rd and 4th yr Maint. Rs.52.0565lakhs, 4th yr maint. Rs.19.4645lakhs)	59.578	10	ha	595.78	Miyawaki Plantation 5 ha during 1st year and 5 ha during 2nd year. (Cost norm is enclosed as ***Annexure-IV***)

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
4	SMC structures in and around the Snigdhajor Nallah. In the Zone of Impact. Rs 50000/- per ha	0.50	500	ha	250	Differnet Nalas of Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF, etc. In the zone of impact and the elephant movement area of the Angul Forest Division. 100 ha per year.
5	Wildlife Awareness / Motivational camps	0.40	50	Nos.	20	10 camps per year
6	Incentive Rewards for Zero Forest Fire VSS / Villages. It will be used for the various Income Generating Activities Rs. 1lakhs in LS per year	1.00	5	Years	5	Reward will be given as per the fire points analysis of the OFMS portal.
7	Anti Depredation Squad (of 10 person):	28.60	5	Nos.	143	With hired vehicle and other contingency. One squad per year.
8	POL for Fire Blowers, vehicles, Motor bikes and boats for patrolling round the clock in the Zone of impact	20.00	5	Years	100	20 Lakhs per year
9	Fire Line Creation & maintenance:	0.045	500	Km	22.5	Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF as per Working Plan prescription. Based on the prevalent wage rate. 100 Km per year
					1246.28	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
B	**Protection & Surveillance**					
10	Wildlife Protection Squad (10 Persons with hired vehicle etc)	28.60	5	Nos.	143	With hired vehicle and other contingency. One squad per year.
11	Anti Depredation Equipment's, Uniform, Contingency and unforeseen expenditures	15.00	5	Years	75	15 Lakhs per year in LS
12	PTZ and AI based early warning system	3.00	15	Nos.	45	
13	Speed monitoring system, Early warning system, Bulk SMS system, etc	0.75	50	Nos.	37.5	
14	Anti-Poaching /Protection barracks	25.00	1	Nos.	25	At Samal Barrage or in the zone of impact; With all logistic support, Solar light and safety measures etc.
15	Strengthening of the existing infrastructure like Anti Poaching Camp, Protection Barrack, Watch Towers including Ration of the staff staying there	15.00	5	Years	75	15 Lakhs per year in LS
16	Various acoustic and farm based deterrence like flash light, spot light, flickering light and other acoustic devices, ANIDERS, etc.	10.00	5	Years	50	10 Lakhs per year in LS
17	Radio collaring of the elephants and related expenditure	7.00	10	Nos.	70	
18	Drone Camera (with Infrared Facilities):	12.00	4	Nos.	48	
19	Special Drone camera with AI based detection system	25.00	1	Nos.	25	
					593.5	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
C	**Research & Development**					
20	Wages of the Two Data Managers for the Data Analysis and Monitoring and Supervision.	0.52	60	Months	31.2	
					31.2	
D	**Peoples Participation:**					
21	Incentivise to Informers, Rewards & Awards	1.00	5	Years	5	For collecting intelligence on crime against Wildlife and allied matters. Rs 1 Lakh per year.
22	Solar street lights in villages.	0.30	50	Nos.	15	
23	High mast lights in different villages	2.00	50	Nos.	100	
24	Deployment of 50 nos. of Gajamitra round the year @ 13,500/- per month and Rs 3750/- per person for uniform, equipment's and various Logistics.	1.68	250	Nos.	420	
25	Training cum Review of Gaj Mitra- including fooding, charges, honorarium for resource persons, logistics and misc. expenditure (8 nos. to be conducted every year at Range level, Rs 15000 per training) (6 Ranges*8 Nos. per year*5years)	0.15	240	Nos.	36	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
26	Creation of Tentacle Solar fencing in the sensitive areas where physical barriers are not possible	50.00	5	LS	250	
					826	
	Total				**2696.98**	
	Add 20% for cost escalation				**539.396**	
	Total				**3236.376**	

CHAPTER-5

ANIMAL PASSAGE PLAN

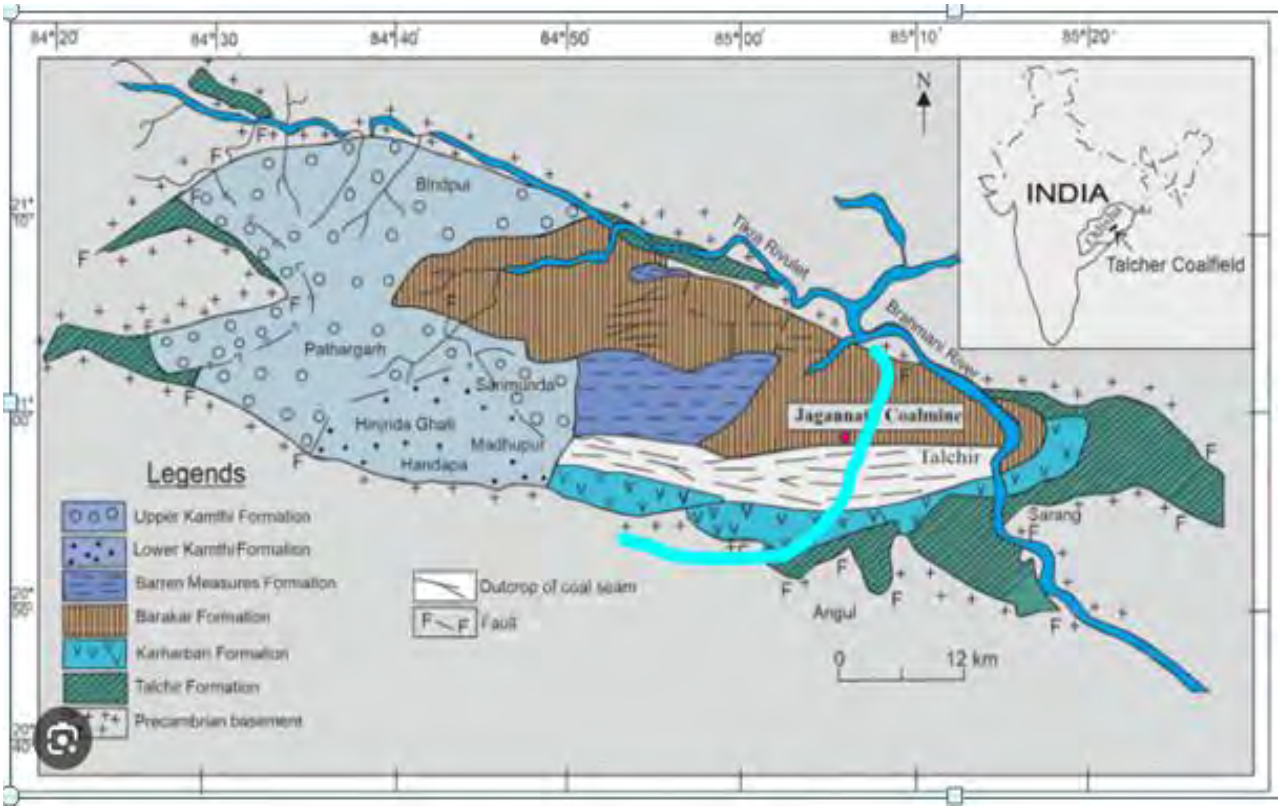
CHAPTER-V
Animal Passage Plan

5.1 Introduction:

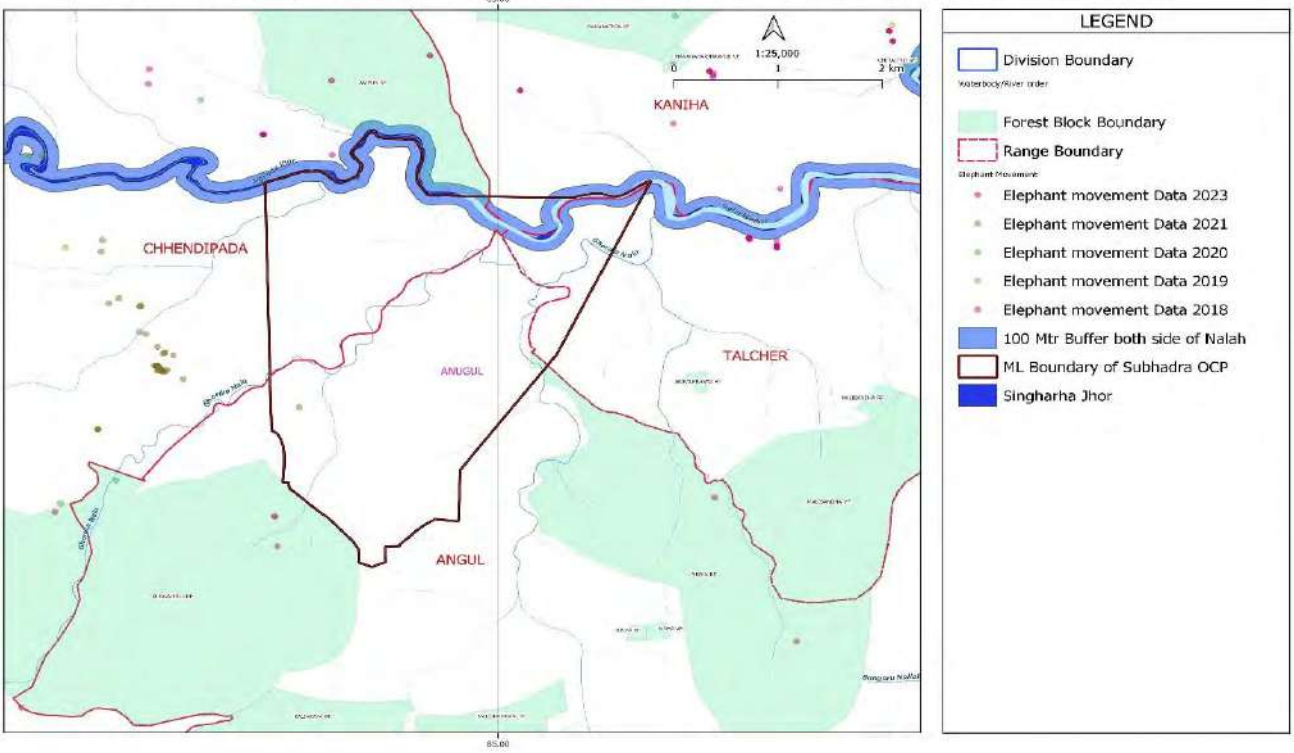
Coal was discovered in the Talcher Coalfields at Gopalprasad in 1837. Handidhua Colliery was opened by M/s Villiers in 1921. NCDC opened several mines – at South Balanda in 1960, Nandira in 1962 and Jagannath in 1972. Production rose from 0.91 million tons in 1972-73 to 33.10 million tons in 2001-02. Talcher Coalfield is subdivided into five production/ administrative areas: Talcher, Jagannath, Kalinga, Lingaraj and Hingula.

According to Geological Survey of India, the Talcher Coalfield has reserves of 38.65 billion tons, the highest in India.

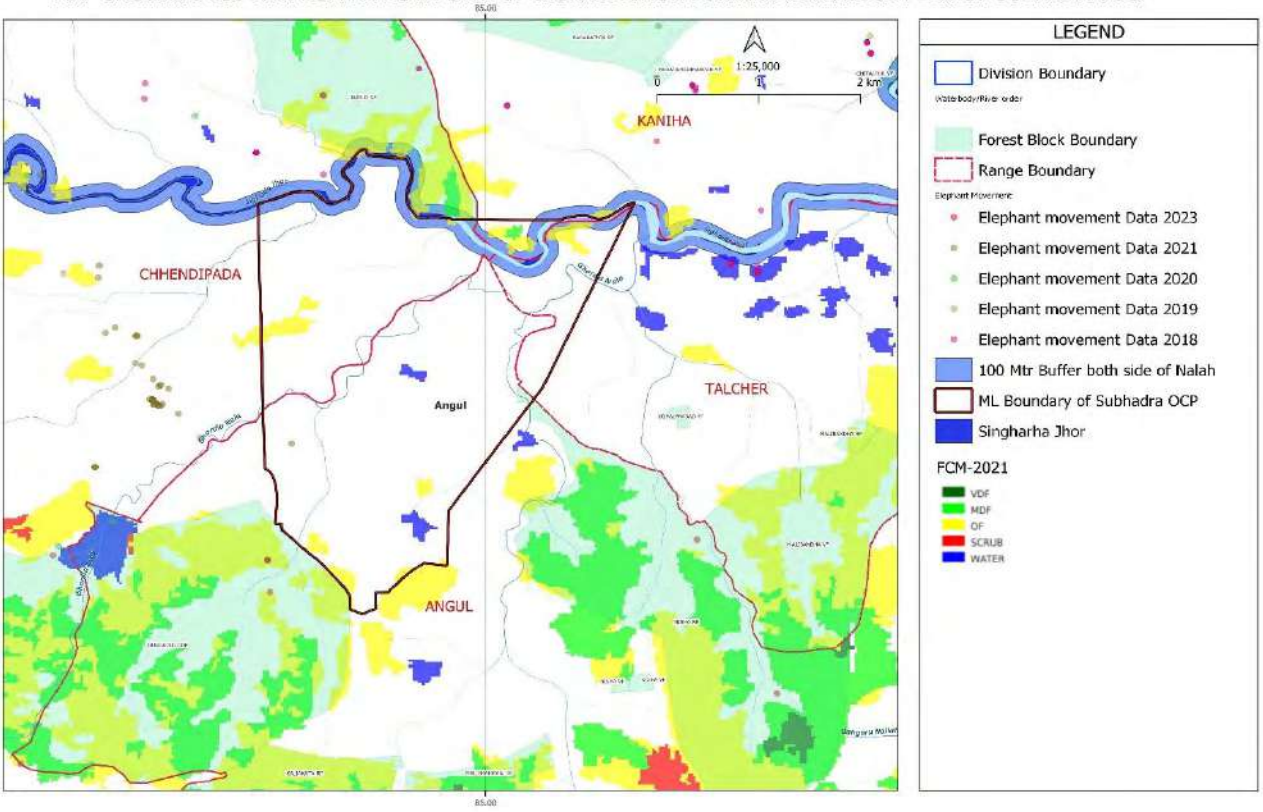
Talcher Coalfield covers an area of 500 km^2 (190 sq mi). Talcher coal is classified as sub-bituminous to high volatile bituminous rank based on the vitrinite reflectance (0.40–0.59%), volatile matter (43.0–55.1%), and carbon content (71.2–79.3%). The ash yield varies from 12.4 to 39.3%. As of 2011, nearly one hundred thousand tons of coal is dispatched daily to power stations in Odisha, Tamil Nadu, Andhra Pradesh, West Bengal and other parts of India.



MAP SHOWING 100 MTR BUFFER BOTH SIDE OF SIGHADA JHOR FOR ANIMAL PASSGE PLAN OF SUBHADRA OCP



MAP SHOWING 100 MTR BUFFER BOTH SIDE OF SIGHADA JHOR FOR ANIMAL PASSGE PLAN OF SUBHADRA OCP



The length of Coal deposit / Coal seam in Talcher Coal field is about 30 km with a varied width of 15-20 km. Combination of all mining blocks in connective mode are forming a linear structure over a length of 30 km. This needs to be addressed and a strip of land with vegetation needs to be left as such to maintain connectivity from S-W to N-E as animal passage / elephant corridor. The deposit lies from South East to North West direction along the river Brahmani as depicted above. Many coal mines are in operation and many others are in pipeline for obtaining Forest and Environment Clearance. Coal is being transported to many power plants in Odisha and outside the state by train. There is also provision for Road side sale for local consumption. About 25% of the produce are being transported outside the Talcher area by Truck / Lorry / Multi-axial trucks of 40-60 Tons Capacity.

5.2 Elephant Movement:

There is wildanimal movement pattern connecting Satkosia Wildlife Sanctuary-cum-Tiger Reserve/ Similipal-Satkosia Corridor with Deogarh Division (Kundheigola RF) /Redhakhol Division (Reamal RF)/Athamallik Division(Handapa RF) to Similipathar RF, Durgapur RF and then to Nisha PF, Rabipur RF through Kanehijena RF then joins to Kanheijena- Anantapur Elephant corridor. Then animals move towards Hadagarh sanctuary via Moulabhanja – Anantapur, corridor. Any disruption or disturbance to the natural movement paths of elephants, tigers, and other animals can lead to human-wildlife conflict along the entire route.

At present movement of Elephant as mentioned below is observed.

“The elephants / leopards from Satkosia Sanctuary / Tiger Reserve/ Deogarh Division (Kundheigola RF) /Redhakhol Division (Reamal RF)/ Athamallik Division (Handapa RF) frequently enters into Adjoining forests of Kanloi RF, Devinagar RF, Similipathar RF- Dangapal PRF, Durgapur RF in the Western side – Nisha RF-Jaipur RF-Badakathia RF-Rabipur RF- Sibarampur RF- Kanheijena RF – To Anantapur RF in Dhenkanal District via elephant corridor crossing the River Brahmani. On the way they are crossing Rengali Right Canal and Left Canal, NH- 23 Canal near Kankilli /Ekagharia Village”.

The Subhadra OCP lease area is seeing occasional movement of the elephants. Nala originating from Durgapur RF / Chendipada Area are flowing towards North- East and joins to River Brahmani / Samal barrage up stream. Durgapur and Jaipur RF’s Bamboo forests situated adjacent to the Subhadra OCP lease area, attracts wildlife like Wild boar, barking Deer, Lizards, Mongoose etc.

5.3 Description of the Subhadra OCP lease area and Elephant movement

The proposed project covers an area of 1111.85 hectares. The block is nearly triangular, with a length of approximately 5.2 km in the north-south direction and a maximum width of about 3.6 km in the east-west direction. The boundary of the block is defined as follows:

- Northern Boundary: The northern side of the project area touches the southern bank of Singhada Jhor, including the proposed diversion.
- Southern Boundary: The southern boundary of the project adjacent to SH 63, which connects Angul to Chhendipada.

- Eastern Boundary: The eastern boundary shares a common boundary with Gopal Prasad East and Hingula Mines.
- Western Boundary: The western boundary shares a common boundary with Utkal B1 and Utkal C.

Major Reserve Forests within the 10 km Boundary:

The following Reserve Forests fall within a 10 km radius of the project area boundary:

- Durgapur RF
- Kaliakata RF
- Kerjang RF
- Kuio RF
- Jaltap RF
- Badakathia RF
- Bramhanbil RF
- Jaipur RF
- Kosala RF
- Khalapal RF
- Maliabandha RF
- Malibramhani RF
- Nisha RF
- Rabipur RF
- Paranga RF
- Similisahi RF
- Saradhapur RF

Presence and Movement of Wildlife:

Based on field data, it was found that various mammals, birds, and reptiles are present within the 10 km boundary of the project area.

Major Mammals:

- Indian Elephant: Field data and evidence suggest that elephant movement is common around the project boundary and occasional inside the lease area of the Subhadra OCP. Due to the presence of multiple Reserve Forests surrounding the project area, elephants move from one Reserve Forest to another at different times of the year. Major movements occur during the crop season and Fruiting season of mango and cashew.
- Leopard: Evidence of leopard movement was found through camera traps and pug mark signs. Leopards generally move in Durgapur RF.
- Other Mammals: Sloth bear, barking deer, wild pig, Indian hare, Indian pangolin, palm squirrel, jackal, Indian porcupine, Rhesus macaque, Hanuman langur, Common Fox, Wild Cat, Indian Field Mouse, Indian Porcupine and palm civet are common within the 10 km boundary of the project area.

List of Birds:

- Forest owlet
- Jungle fowl
- Myna
- Kingfisher,
-Parakeet,
-Sikra,
-Indian Koel & many more.

List of reptiles:

-King Cobra
- Indian Python
- Monocellata Cobra
-Spectacled Cobra
-Garden Lizard
-Rock Agama
-Monitor Lizard & etc.

Based on VHF data and the elephant movement register, the movement pattern of elephants within the 10 km boundary of the project area is provided for the years 2022-2024, in both tabular form and on a map.

Date wise Elephant movement within 10 KM buffer zone area of Subhadra OCP of the Angul Forest Division

Date	No of Elephant	From	To	GPS Reading						Via
				D	M	S	D	M	S	
04.07.2022	1	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	48.1	84	53	0.9	
05.07.2022	1	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	48.2	84	53	1	
06.07.2022	1	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	48.8	84	52	27	
07.07.2022	1	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	13.8	84	52	42.2	
08.07.2022	1	Durgapur RF (Compt. No-1)	durgapur RF (Compt. No-2)	20	56	43.1	84	54	38.1	
09.07.2022	1	durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-1)	20	56	35.6	84	53	3.7	
10.07.2022	1	Durgapur RF (Compt. No-1)	Similipathar RF	20	56	17	84	52	43.2	
11.07.2022	3	Kankurpal RF	Jaltap RF	21	2	15.1	84	58	55.4	
12.07.2022	3	Jaltap RF	Jaipur RF	21	0	14.1	84	58	22.3	
13.07.2022	3	Jaipur RF	Kumunda Beat	20	58	57.9	84	58	52.1	

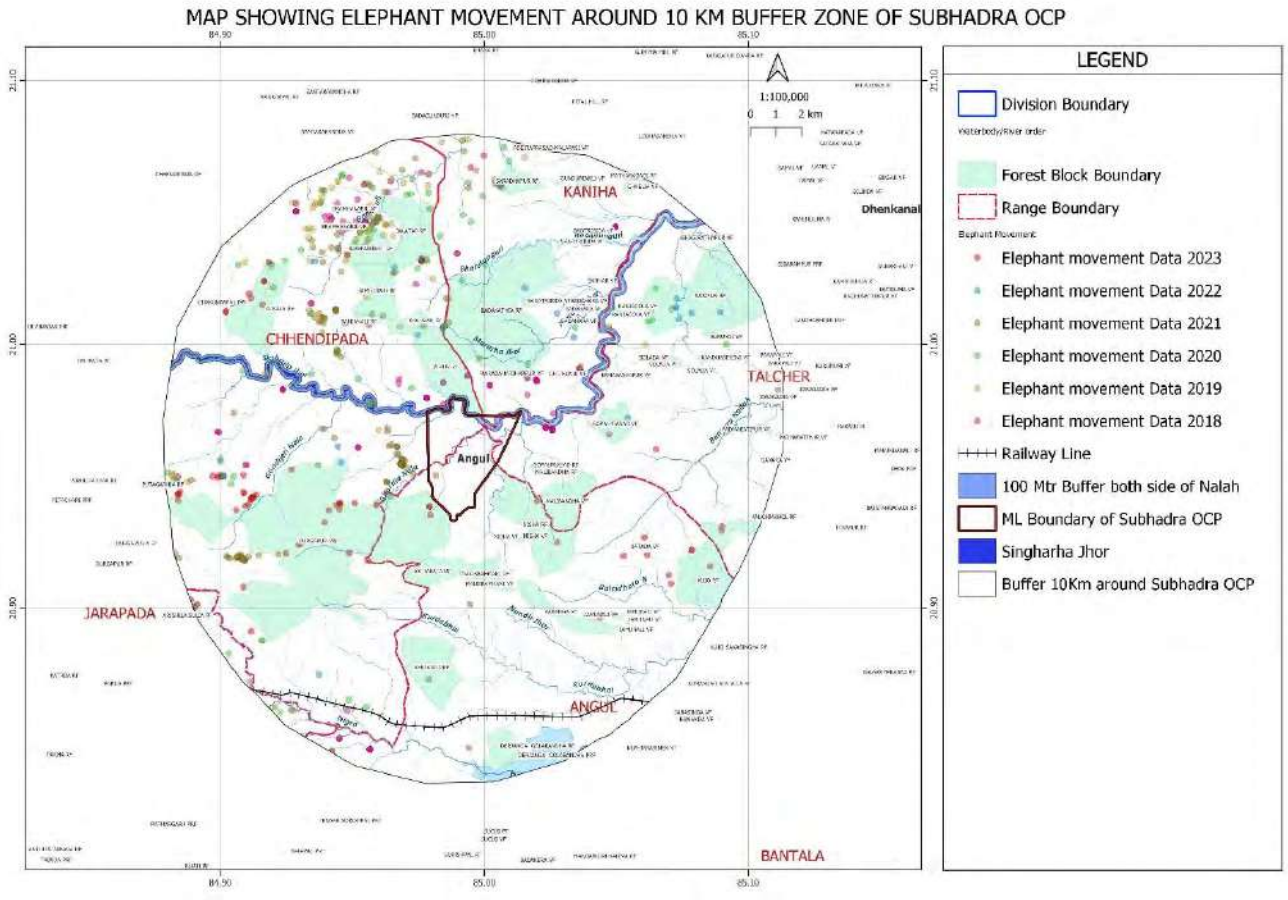
16.07.2022	2	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	32	84	53	2	
18.07.2022	2	Durgapur RF (Compt. No-1)	Similisahi RF	21	1	22.1	84	57	17	
19.07.2022	2	Similisahi RF	Kankurpal RF	21	6	26.3	84	55	23.8	
31.08.2022	3	Chhendipada RF	Jaltap RF	21	1	45.7	84	57	57.7	
01.09.2022	3	Jaltap RF	Similisahi RF	21	1	0.4	84	57	14.5	
01.09.2022	1	Kankurpal RF	Jaltap RF	21	1	42.8	84	57	58.3	
02.09.2022	1	Jaltap RF	Jaltap RF	21	1	37.7	84	57	58.5	
10.10.2022	1	Katatada Beat	Jaipur RF	21	0	13.3	84	58	29.6	Jamanuda, Durgapur RF (Compt. No-8)Raijharan
19.12.2022	1	Kankurpal RF	Jaltap RF	21	1	56.6	84	58	34.2	
20.12.2022	1	Jaltap RF	Durgapur RF (Compt. No-3)	20	57	18.8	84	56	44.9	Raijharan
27.12.2022	21	Similipathar RF	Durgapur RF (Compt. No-1)	20	57	0	84	54	4.7	
20.01.2023	2	Santarabandha RF	Kosala RF	21	1	52.2	84	55	6.1	Balinali village
29.01.2023	2	Basantapur Beat	Chakundapal DPF	21	1	3.2	84	54	42.1	Kukurpeta
30.01.2023	2	Chakundapal DPF	Kosala RF	21	1	10.8	84	55	15.8	
30.01.2023	1	Similipathar RF	Durgapur RF (Compt. No-2)	20	56	58.4	84	53	56.3	
31.01.2023	2	Kosala RF	Chakundapal DPF	21	0	39.9	84	53	39.6	
01.02.2023	1	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-2)	20	55	55.6	84	54	40.6	
10.02.2023	2	Similipathar RF	Durgapur RF (Compt. No-3)	20	56	13.6	84	56	28.1	Korada, Jhintipal
11.02.2023	2	Durgapur RF (Compt. No-3)	Durgapur RF (Compt. No-1)	20	56	28.8	84	52	45.1	Korada, Jhintipal
12.02.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	57	0.6	84	53	50.1	
13.01.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	55	57.3	84	54	16.1	
18.02.2023	2	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	38.7	84	53	5.1	
19.02.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-2)	20	56	31.5	84	54	45	
20.02.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-8)	20	55	57.2	84	56	22.5	Durgapur, Banardiha, Kerejang

21.02.2023	2	Durgapur RF (Compt. No-8)	Durgapur RF (Compt. No-5)	20	55	15.5	84	56	55.7	Banardiha, Kerejang, Odakapa
22.02.2023	2	Durgapur RF (Compt. No-5)	Durgapur RF (Compt. No-1)	20	56	34.1	84	53	1.9	Korada, Durgapur
27.02.2023	2	Similipathar RF	Durgapur RF (Compt. No-2)	20	56	29.3	84	54	42.5	Putagadia, Korada
28.02.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-8)	20	56	22.8	84	56	42.7	Kerejang, Banardiha
06.03.2023	2	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	13	84	52	41.8	Putagadia
08.03.2023	1	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	14.3	84	52	42	Putagadia , Korada
09.03.2023	1	Durgapur RF (Compt. No-1)	Putagadia RF	20	56	56.6	84	51	44.6	
11.03.2023	2	Similipathar RF	Durgapur RF (Compt. No-3)	20	57	9.6	84	55	37.1	Nandichhore, Jhintipal, Korada
12.03.2023	2	Durgapur RF (Compt. No-3)	Durgapur RF (Compt. No-1)	20	56	14.2	84	52	42.1	
13.03.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	11.3	84	52	42.7	
13.03.2023	1	Similipathar RF	Durgapur RF (Compt. No-8)	20	56	20.4	84	56	37.7	Putagadia, Korada, Jhintipal
14.03.2023	1	Durgapur RF (Compt. No-8)	Durgapur RF (Compt. No-8)	20	55	4.4	84	57	21.3	
14.03.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-1)	20	56	12.3	84	52	42.1	
15..03.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-3)	20	55	26.3	84	55	46.6	
16.03.2023	2	Durgapur RF (Compt. No-3)	Durgapur RF (Compt. No-2)	20	56	19.4	84	54	34.4	
17.03.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-2)	20	56	9.4	84	54	42.9	
18.03.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-2)	20	56	31.6	84	54	45	
01.04.2023	2	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	36	84	53	2.8	
02.04.2023	2	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-2)	20	56	29.2	84	54	42.6	
03.04.2023	2	Durgapur RF (Compt. No-2)	Durgapur RF (Compt. No-8)	20	56	23.4	84	57	2.9	Bhalugadia
04.04.2023	2	Durgapur RF (Compt. No-8)	Durgapur RF (Compt. No-5)	20	55	27.7	84	55	49.7	Banardiha
10.04.2023	2	Nisha Beat	Durgapur RF	20	56	14.5	84	56	42.5	

			(Compt. No-8)							
21.04.2023	1	Basantapur Beat	Kosala RF	21	1	26.5	84	54	59.9	Kukurpeta
22.04.2023	1	Kosala RF	Bramhanbil RF	21	2	0.1	84	56	51.4	Bhagalakata
23.04.2023	1	Bramhanbil RF	Chakundapal DPF	21	0	57.3	84	54	27	Bramhanbil
08.05.2023	1	Similipathar RF	Durgapur RF (Compt. No-1)	20	56	35.8	84	53	2.7	
10.05.2023	1	Durgapur RF (Compt. No-1)	Durgapur RF (Compt. No-2)	20	56	31.6	84	54	45.5	went to Nisha Beat
12.05.2023	1	Nisha Beat	Durgapur RF (Compt. No-8)	20	56	22.1	84	56	43.3	
12.06.2023	1	Basantapur Beat	Kosala RF	21	0	54.2	84	54	57.6	Kukurpeta
16.06.2023	1	Similipathar RF	Durgapur RF (Compt. No-2)	20	56	37.1	84	54	32.7	went to Similipathar RF
03.07.2023	1	Karatapata Beat	Jaipur RF	21	0	24.9	84	57	22.4	Badakerejang, Raijharan, Golagadia
18.07.2023	4	Kankurpal RF	Chakundapal DPF	21	0	44.7	84	54	7.9	Karadabahal, Balinali
19.07.2023	4	Chakundapal DPF	Chhendipada RF	21	3	5.2	84	53	3.9	
25.07.2023	3	Kankurpal RF	Jaltap RF	21	1	55.1	84	58	34.3	Bramhanbil
31.07.2023	2	Similipathar RF	Durgapur RF (Compt. No-5)	20	55	14.9	84	55	26.9	Durgapur, Korada
01.08.2023	2	Durgapur RF (Compt. No-5)	Durgapur RF (Compt. No-8)	20	56	20.4	84	57	32.4	
02.08.2023	2	Durgapur RF (Compt. No-8)	Durgapur RF (Compt. No-8)	20	56	22.9	84	56	42.6	went to Nisha Beat
04.08.2023	2	Nisha Beat	Durgapur RF (Compt. No-6)	20	54	28.9	84	54	31.4	went to Hinsar Beat
23.02.2024	1	Kadalimuda Beat	Jaipur RF	20	58	46.5	84	59	15	Durgapur, Raijharan , Sandhapal, Kudapal
11.03.2024	1	Similipathar RF	Durgapur RF (Compt. No-2)	20	56	29.4	84	54	42.6	
27.04.2024	1	Kasidiha Mango Orchard	Balinali Mango Orchard	21	2	43.3	84	54	59.6	
28.04.2024	1	Balinali Mango Orchard	Bhagalakata VF	21	1	59.9	84	55	21.9	
29.04.2024	1	Bhagalakata VF	Kosala RF	21	1	27.7	84	55	27.4	
30.04.2024	1	Kosala RF	Badapal Mango	20	59	40.7	84	54	40.2	

			Orchard							
01.05.2024	1	Badapal Mango Orchard	Korada Mango Orchard	20	57	27.5	84	54	23.9	Nandichhore, Kaithadhipa
02.05.2024	1	Korada Mango Orchard	Durgapur RF (Compt. No-8)	20	55	29.6	84	57	28.7	went to Nisha Beat
05.05.2024	1	Nisha Beat	Jaipur RF	20	58	38.6	84	59	45.7	
06.05.2024	1	Jaipur RF	Jaipur RF	20	58	47.1	84	59	16.1	
08.05.2024	1	Nisha Beat	Durgapur RF (Compt. No-8)	20	56	46.8	84	57	47.8	
16.05.2024	1	Kumuda Beat	Takua Mango Orchard	21	3	17.8	84	58	48.3	Went to Dereng Beat

Based on the tabular data it was found that, Elephant movement is very close to the Project area.



5.4 Development of Elephant Corridor:

As the eastern and western boundaries of the project area are adjacent to other mining areas, some of which are operational and others will soon be operational, this will completely block animal movements from the southern side to the northern side and vice versa. Given that elephants are mega-herbivores with long-range movement patterns, restricting their movement paths presents a significant challenge. However, certain

interventions can be implemented within the Reserve Forests to ensure that animals remain within the forested areas while meeting all their requirements.

More and more disturbances will be there along their movement path through Jagannath Colliery. The animals may find it difficult in communicating through these collieries. To maintain their Habitat connectivity, it is proposed to leave aside a strip of land on both sides of the Singhada Jhor Nala (100m width from the bank of the nala) which will be a non-disturbance zone. Vegetation by utilizing various fodder species will be created on both sides of nala. This nala will not be disturbed throughout the life of the mines.
It has been provided to create small water holes / ponds by using sand bags.

This will ensure water availability during summer also. Apart from it, various SMC measures like Check Dams, LBCD, Percolation pits, etc will be executed along the Nala to ensure water availability round the year.
The user agency i.e. MCL will take steps to

i. Maintain no mining Zone along this Singhada Jhor Nala (100m on both sides) total width of the proposed passage 250m (2x100m + 50 m) including the width of the Singhada Jhor Nala.
ii. Maintain vegetation cover all along the Nala,
iii. Steps are to be taken to keep this nala free from any garbage especially plastic bottles / Polythene.
iv. Motivational drive among the villagers living near to this Nalla. Implement community awareness programs to educate local populations about the importance of wildlife conservation and ways to reduce human-animal conflicts.
v. Extensive SMC measures to be taken along the Nala to ensure water availability round the year.
vi. MCL will ensure that no pollutants and discharge from the mining activity will enter the Nala.

Therefore, the user agency, MCL, will submit an undertaking along with this Site-Specific Wildlife Management Plan to implement the measures mentioned above for the Animal Passage Plan within the mining lease area of Subhadra OCP, under the supervision of the Forest Department in the future.

CHAPTER-6

FINANCIAL FORECAST

FINANCIAL FORECAST

The conservation scheme with a major focus on elephant conservation. Below are the appropriations for the Wildlife Conservation Plan. **(Table 6.1, 6.2 and 6.3)**

Table 6.1 Abstract of Interventions of Angul Division

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
A	**Habitat Improvement**					
1	Weed eradication (30 Mandays) and Sowing of seeds (10 Mandays) in the zone of Impact for the rejuvenation and restoration of the Elephant Habitat. 40 Mandays (40x450/-= 18000/-)per ha.	0.180	500	ha	90	Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF, etc. In the zone of impact and the elephant movement area of the Angul Forest Division. 100 ha per year
2	Creation of Water Body	10.00	2	Nos.	20	In the zone of impact and the elephant movement area of the Angul Forest Division.
3	Miyawaki plantations in small blank patches of the degraded forests coming within the elephant habitat for the quick restoration & rejuvenation. (Miyawaki Plantation 5 ha during 1st year Rs.192.375lakhs and 5 ha during 2nd year including maintenance Rs.245.833 lakhs, 2nd and 3rd Maint. Rs.86.051 lakhs, 3rd and 4th yr Maint. Rs.52.0565lakhs, 4th yr maint. Rs.19.4645lakhs)	59.578	10	ha	595.78	Miyawaki Plantation 5 ha during 1st year and 5 ha during 2nd year. (Cost norm is enclosed as ***Annexure-IV***)

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
4	SMC structures in and around the Snigdhajor Nallah. In the Zone of Impact. Rs 50000/- per ha	0.50	500	ha	250	Differnet Nalas of Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF, etc. In the zone of impact and the elephant movement area of the Angul Forest Division. 100 ha per year.
5	Wildlife Awareness / Motivational camps	0.40	50	Nos.	20	10 camps per year
6	Incentive Rewards for Zero Forest Fire VSS / Villages. It will be used for the various Income Generating Activities Rs. 1lakhs in LS per year	1.00	5	Years	5	Reward will be given as per the fire points analysis of the OFMS portal.
7	Anti Depredation Squad (of 10 person):	28.60	5	Nos.	143	With hired vehicle and other contingency. One squad per year.
8	POL for Fire Blowers, vehicles, Motor bikes and boats for patrolling round the clock in the Zone of impact	20.00	5	Years	100	20 Lakhs per year
9	Fire Line Creation & maintenance:	0.045	500	Km	22.5	Durgapur RF, Barakathia RF, Hirapur RF, Kerjang RF, Nisha PF and Rakas RF as per Working Plan prescription. Based on the prevalent wage rate. 100 Km per year
					1246.28	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
B	**Protection & Surveillance**					
10	Wildlife Protection Squad (10 Persons with hired vehicle etc)	28.60	5	Nos.	143	With hired vehicle and other contingency. One squad per year.
11	Anti Depredation Equipment's, Uniform, Contingency and unforeseen expenditures	15.00	5	Years	75	15 Lakhs per year in LS
12	PTZ and AI based early warning system	3.00	15	Nos.	45	
13	Speed monitoring system, Early warning system, Bulk SMS system, etc	0.75	50	Nos.	37.5	
14	Anti-Poaching /Protection barracks	25.00	1	Nos.	25	At Samal Barrage or in the zone of impact; With all logistic support, Solar light and safety measures etc.
15	Strengthening of the existing infrastructure like Anti Poaching Camp, Protection Barrack, Watch Towers including Ration of the staff staying there	15.00	5	Years	75	15 Lakhs per year in LS
16	Various acoustic and farm based deterrence like flash light, spot light, flickering light and other acoustic devices, ANIDERS, etc.	10.00	5	Years	50	10 Lakhs per year in LS
17	Radio collaring of the elephants and related expenditure	7.00	10	Nos.	70	
18	Drone Camera (with Infrared Facilities):	12.00	4	Nos.	48	
19	Special Drone camera with AI based detection system	25.00	1	Nos.	25	
					593.5	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
C	**Research & Development**					
20	Wages of the Two Data Managers for the Data Analysis and Monitoring and Supervision.	0.52	60	Months	31.2	
					31.2	
D	**Peoples Participation:**					
21	Incentivise to Informers, Rewards & Awards	1.00	5	Years	5	For collecting intelligence on crime against Wildlife and allied matters. Rs 1 Lakh per year.
22	Solar street lights in villages.	0.30	50	Nos.	15	
23	High mast lights in different villages	2.00	50	Nos.	100	
24	Deployment of 50 nos. of Gajamitra round the year @ 13,500/- per month and Rs 3750/- per person for uniform, equipment's and various Logistics.	1.68	250	Nos.	420	
25	Training cum Review of Gaj Mitra- including fooding, charges, honorarium for resource persons, logistics and misc. expenditure (8 nos. to be conducted every year at Range level, Rs 15000 per training) (6 Ranges*8 Nos. per year*5years)	0.15	240	Nos.	36	

Sl. No	Interventions	Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	Remark
26	Creation of Tentacle Solar fencing in the sensitive areas where physical barriers are not possible	50.00	5	LS	250	
					826	
	Total				**2696.98**	
	Add 20% for cost escalation				**539.396**	
	Total				**3236.376**	

(Rupees Thirty Two crores Thirty Six lakhs Thirty Seven thousand Six hundred only)

Project Head
Subhadra Coal Mining Ltd., Angul

Staff Officer(Envt.& Forest)
MCL Subhada Area

महा प्रबंधक
एमसीएल, सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area

Divisional Forest Officer
Angul, Division

Recommended.

26/9/24
Regional Chief Conservator
of Forests, Angul Circle.

Approved

Principal Chief Conservator of Forests
(Wildlife) & Chief Wildlife Warden
Odisha, Bhubaneswar

Table 6.2 Physical & Finanancial Flow Chart of Angul Division

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
A	**Habitat Improvement**										
1	Weed eradication (30 Mandays) and Sowing of seeds (10 Mandays) in the zone of Impact for the rejuvenation and restoration of the Elephant Habitat. 40 Mandays (40x450/- = 18000/-)per ha.	0.180	500	ha	90	18	18	18	18	18	90
2	Creation of Water Body	10.00	2	Nos.	20	10	10				20
3	Miyawaki plantations in small blank patches of the degraded forests coming within the elephant habitat for the quick restoration & rejuvenation. (Miyawaki Plantation 5 ha during 1st year Rs.192.375lakhs and 5 ha during 2nd year including maintenance Rs.245.833 lakhs, 2nd and 3rd Maint. Rs.86.051 lakhs, 3rd and 4th yr Maint. Rs.52.0565lakhs, 4th yr maint. Rs.19.4645lakhs)	59.578	10	ha	595.78	192.375	245.833	86.051	52.0565	19.4645	595.78

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
4	SMC structures in and around the Snigdhajor Nallah. In the Zone of Impact. Rs 50000/- per ha	0.50	500	ha	250	50	50	50	50	50	250
5	Wildlife Awareness / Motivational camps	0.40	50	Nos.	20	4	4	4	4	4	20
6	Incentive Rewards for Zero Forest Fire VSS / Villages. It will be used for the various Income Generating Activities Rs. 1lakhs in LS per year	1.00	5	Years	5	1	1	1	1	1	5
7	Anti Depredation Squad (of 10 person):	28.60	5	Nos.	143	28.6	28.6	28.6	28.6	28.6	143
8	POL for Fire Blowers, vehicles, Motor bikes and boats for patrolling round the clock in the Zone of impact	20.00	5	Years	100	20	20	20	20	20	100
9	Fire Line Creation & maintenance:	0.045	500	Km	22.5	4.5	4.5	4.5	4.5	4.5	22.5
	Sub-Total				**1246.28**	**328.475**	**381.933**	**212.151**	**178.1565**	**145.5645**	**1246.28**

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
B	**Protection & Surveillance**										
10	Wildlife Protection Squad (10 Persons with hired vehicle etc)	28.60	5	Nos.	143	28.6	28.6	28.6	28.6	28.6	143
11	Anti Depredation Equipment's, Uniform, Contingency and unforeseen expenditures	15.00	5	Years	75	15	15	15	15	15	75
12	PTZ and AI based early warning system	3.00	15	Nos.	45	24	21				45
13	Speed monitoring system, Early warning system, Bulk SMS system, etc	0.75	50	Nos.	37.5	18.75	18.75				37.5
14	Anti-Poaching /Protection barracks	25.00	1	Nos.	25	25					25
15	Strengthening of the existing infrastructure like Anti Poaching Camp, Protection Barrack, Watch Towers including Ration of the staff staying there	15.00	5	Years	75	15	15	15	15	15	75
16	Various acoustic and farm based deterrence like flash light, spot light, flickering light	10.00	5	Years	50	10	10	10	10	10	50

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
	and other acoustic devices, ANIDERS, etc.										
17	Radio collaring of the elephants and related expenditure	7.00	10	Nos.	70	14	14	14	14	14	70
18	Drone Camera (with Infrared Facilities):	12.00	4	Nos.	48	48					48
19	Special Drone camera with AI based detection system	25.00	1	Nos.	25	25					25
	Sub-Total				**593.50**	**223.35**	**122.35**	**82.60**	**82.60**	**82.60**	**593.50**

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
C	**Research & Development**										
20	Wages of the Two Data Managers for the Data Analysis and Monitoring and Supervision.	0.52	60	Months	31.2	6.24	6.24	6.24	6.24	6.24	31.2
	Sub-Total				**31.2**	**6.24**	**6.24**	**6.24**	**6.24**	**6.24**	**31.20**
D	**Peoples Participation:**										
21	Incentivise to Informers, Rewards & Awards	1.00	5	Years	5	1	1	1	1	1	5
22	Solar street lights in villages.	0.30	50	Nos.	15	7.5	7.5				15
23	High mast lights in different villages	2.00	50	Nos.	100	50	50				100
24	Deployment of 50 nos. of Gajamitra round the year @ 13,500/- per month and Rs 3750/- per person for uniform, equipment's and various Logistics.	1.68	250	Nos.	420	84	84	84	84	84	420
25	Training cum Review of Gaj Mitra- including fooding, charges, honorarium for resource persons, logistics and misc. expenditure (8 nos. to be conducted every year at Range level, Rs 15000 per training) (6 Ranges*8 Nos. per year*5years)	0.15	240	Nos.	36	7.2	7.2	7.2	7.2	7.2	36

SL. No	Interventions	Target				Year					
		Rate (In Lakh)	Quantity	Unit	Amount (In Lakh)	1st Year	2nd year	3rd Year	4th Year	5th Year	Total
26	Creation of Tentacle Solar fencing in the sensitive areas where physical barriers are not possible	50.00	5	LS	250	50	50	50	50	50	250
	Sub-Total				**826**	**199.7**	**199.7**	**142.2**	**142.2**	**142.2**	**826**
	Total				**2696.98**	**757.7650**	**710.2230**	**443.1910**	**409.1965**	**376.6045**	**2696.980**
	Add 20% for cost escalation				**539.396**	**151.5530**	**142.0446**	**88.6382**	**81.8393**	**75.3209**	**539.396**
	Total				**3236.376**	**909.3180**	**852.2676**	**531.8292**	**491.0358**	**451.9254**	**3236.376**

Project Head
Subhadra Coal Mining Ltd., Angul

Staff Officer(Envt.& Forest)
MCL Subhada Area

महा प्रबंधक
एमसीएल, सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area

Divisional Forest Officer
Angul, Division

Table 6.3 Budget under Conservation Plan

Note: All the conservation activities shall be carried out with the participation of the State Forest Department and other expert Institutions of the region. Planting material will be procured from local or nearby nurseries of Forest department and subsequently from high tech nursery proposed in this plan. Iron-guards will also be installed to protect the early growth of saplings/seedlings to protect them from grazing/browsing.

Table 6.3 Budget under activities to be implemented by the project proponent under this conservation plan

Sl No.	Management interventions
1	Awareness activities on conservation of wildlife by project proponent (Trainings, lectures, film screenings, informative leaflets, organizing essay writing, debate, and drawing competitions in schools and colleges, staging street plays and Nukad Natak, celebrating important days related to wildlife conservation, conducting training sessions, boosting awareness through social media platforms, creating informational pamphlets and others that are appropriate) ***Intent- Encourage the public to be more conscious of wildlife conservation efforts and importance of wildlife***
2	Immunization/ vaccenation of Livestock through organizing camps by project proponent ***Intent- Regular vaccination against Foot and Mouth Disease (F.M.D) in order to mitigate the transmission of diseases carried by cattle within the forest and minimize their detrimental effects on the wildlife.***
3	5% of the project cost i.e Rs.161.8188/- Lakhs will be deposited by the UA in account of the Wildlife Society of Odisha (The total Project Cost Rs.3236.376/- * 5% = Rs. 161.8188/- Lakhs)

4	The user agency, MCL, will submit an undertaking along with this Site-Specific Wildlife Management Plan, committing to provide the necessary funds and physical support to ensure the proper implementation of the points wise measures i.e. point no.1 to 6 mentioned in the Animal Passage Plan in and around the Subhadra OCP mining lease area in the future.

Project Head
Subhadra Coal Mining Ltd., Angul

Staff Officer(Envt.& Forest)
MCL Subhadra Area

Divisional Forest Officer
Angul Division

Divisional Forest Officer
Angul, Division

महा प्रबंधक
एमसीएल, सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area

Approved

Principal Chief Conservator of Forests
(Wildlife) & Chief Wildlife Warden
Odisha, Bhubaneswar

ANNEXURES

File No. J-11015/72/2021- IA-II(M)
Government of India
Ministry of Environment, Forest and Climate Change
(Impact Assessment Division)
*****

Indira ParyavaranBhawan,
Jorbagh Road, N Delhi – 3
Email: lk.bokolia@nic.in Tel: 01124695363

Dated: 22nd November, 2021

To,

The Chief General Manager (CP&P)
M/s Mahanadi Coalfields Limited
PO - JagrutiVihar, Burla,
Sambalpur-768 020 (Odisha)

E-mail: cgmenvt2014@gmail.com

Sub: Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coal field Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha) - For Terms of Reference- reg

Sir,

This has reference to your Online Proposal No. IA/OR/CMIN/232524/2021 dated 13th October, 2021, on the above-mentioned subject.

2. The Ministry of Environment, Forest and Climate Change has considered the proposal for grant of Terms of Reference to Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coal field Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha).

3. The proposal was considered by the sectoral Expert Appraisal Committee (EAC) in the Ministry in its 21th EAC meeting held on 27th October, 2021 through Video Conferencing. The details of the project, as per the documents submitted by the project proponent, and also as informed during the meeting, are reported to be as under: -

(i) The project area is covered under Survey of India Topo sheet No: F45Z13 & F45T1 on RF 1:50,000 and is bounded by the geographical coordinates ranging from latitude 20°55'56.225" to 20°58'47.344" N and longitudes 84° 58'42.383" to 85° 0'50.476" E.
(ii) Coal linkage of the project: Basket Linkage to consumer all over India
(iii) No Joint venture cartel has been formed.
(iv) Project does not fall in the Critically Polluted Area (CPA)where the MoEF&CC vide its OM dated 13th January 2010 has imposed moratorium on grant of environment clearance.

(v) Employment generation: 2108 manpower will be deployed which will provide direct employment and other near about 5,000 people will also be attracted to an economically resurgent area providing service/education etc.

(vi) The project is reported to be beneficial in terms of

- Improvement in physical Infrastructure and infrastructure like roads, school building, provision of drinking water, community hall, plantation etc.
- Increase in employment Potential.
- Contribution of Direct tax, sales tax, Royalty etc to the National Exchequer.
- Overall economic growth of the country.

(vii) Total mining lease area as per block allotment is 1111.85 Ha. Mining plan (including Progressive Mine closure plan) has been approved by the MCL Board vide letter no. MCL/SBP/CS/BD-235/Exct/2021/111767 dt- 07.06.2021.

(viii) The land usage pattern of the project is as follows:
Pre-mining land use details (Area in Ha)

S. No.	Land Use	Within ML Area	Outside ML Area	Total
1	Agricultural Land	800.50	--	800.50
2	Forest Land	125.24	--	125.24
3	Wasteland	92.64	--	92.64
4	Grazing Land	58.67	--	58.67
5	Surface Water Bodies	6.28	--	6.28
6	Settlement	0.00	--	0.00
7	Others(specify)	28.27	--	28.27
8	Old Excavation Area(East Quarry)	NA	--	NA
9	Old Excavation Area(West Quarry)	NA	--	NA
10	Old OB Dumps	NA	--	NA
11	Roads and Mine Infrastructure	0.25	--	0.25
12	R&R colony	NA	--	NA
13	Staff Colony	NA	--	NA
14	Green belt	NA	--	NA
15	Balance Area	0.00	--	0.00
	Total Project Area	**1111.85**		**1111.85**

Post Mining

Sl No	Land Use	Land use (Ha)				
		Plantation/ Agriculture	Water Body	Public Use	Undisturbed	Total
1	External OB Dump	24.17	--	--	--	24.17
2	Top Soil dump	8.97	--	--	--	8.97

3	Excavation	715.24	--	--	130.68	845.92
4	Roads	--	--	15.72	--	15.72
5	Built- up Area	117.26	--	37.35	--	154.61
6	Green Belt	6.89	--	--	--	6.89
7	Undisturbed Area	--	--	--	--	0.00
8	Safety Zone Rationalization Area	11.79	--	--	--	11.79
9	Diversion/Below River/Nala/Canal	--	--	8.42	--	8.42
10	Water Body	--	35.36	--	--	35.36
11	Staff Colony	--	--	--	--	0.00
	Total Area	884.32	35.36	61.49	130.68	1111.85

(ix) Total geological reserve reported in the mine lease area is 1108.39 Mt with 791.04 Mt as mineable reserves. Out of total mineable reserve of 791.04 Mt, 768.83 Mt are available for extraction. Percent of extraction is 97.19%.

(x) 9seams with thickness ranging from 0.13 to 35.26are workable. Grade of Coal is G-13, Stripping ratio is 0.93 while average gradient is 3.480

(xi) Method of mining operations envisages by Opencast Mining Method Coal winning by Surface Miner, pay loader& tipper and OB removed by Shovel-Dumper combination.

(xii) Life of mine is 36 years (as on 1.04.2022)

(xiii) The project has one temporary external OB dumps in an area of 24.17 ha with 30 m height and 103.72 Mm3 of OB which will be re-handled and simultaneously backfilled into the de-coaled area (internal OB dumping). An area of 715.24 ha is proposed for internal OB dump. Total 716.90 Mm3 of OB material is envisaged for backfilling in internal OB dump.

(xiv) Total quarry area is 881.28 ha out of which backfilling will be done in 715.24 ha while final mine void will be created in an area of 35.36 ha with a depth of 30m. Backfilled quarry area of 715.24Ha shall be reclaimed with plantation/grass/agriculture.

(xv) Transportation of coal has been proposed by tippers /pay loader in mine pit head, from surface to siding by close conveyor and at sidings by RLS with railway.

(xvi) Reclamation Plan in an area of 884.32ha, comprising of 24.17 ha of temporary external dump, 715.24 ha of internal dump, 6.89 Ha of Green Belt. In addition to this, an area of 138.02ha. included in the roads/infrastructure and built-up area, top soil dump has also been proposed for green belt development.

(xvii) 125.24 ha of forest land has been reported to be involved in the project.

(xviii) No National Parks, Wildlife Sanctuaries and Eco-Sensitive Zones have been reported with 10km boundary of the project.

(xix) The range of ground water is varying between 3.42 mbgl to 10.12 mbgl during the pre-monsoon in core zone and between 2.25mbgl to 10.90mbgl in buffer zone. During the post monsoon period it is varying between 1.17mbgl to 5.00mbgl in core zone and between 2.15mbgl to 7.80mbgl in buffer zone. Total water requirement for the project is 5.525MLD

(xx) The seasonal nallah, Ghurudia Nallah is flowing within the mine boundary and Singhada Jhor in extreme north boundary of the mine. It is planned for diversion of Guhuridia Nallah in the eastern boundary of the mine and Singhada Jhor will be straighten in north boundary.

(xxi) No court cases, violation cases are pending against the project of the PP.

(xxii) The project does not involve violation of the EIA Notification, 2006 and amendment issued there under.

(xxiii) The project involves 1425project affected families. R&R of the PAPs will be done as per Orissa Rehabilitation and Resettlement Policy 2006.

(xxiv) Total cost of the project is Rs. 3955.65 Cr. Cost of production is Rs.678.00 per tonne, CSR cost is Rs.2.00 per tonne or 2% of the average net profit of the Company of the three immediately preceding financial years whichever is higher. R&R cost is Rs.405.46 crores. Environment Management Cost is Rs 76.12crores.

4. The Expert Appraisal Committee in its 21st EAC meeting held on 27th October, 2021, through Video Conferencing has recommended the proposal for grant of Terms of References (ToR). Based on the recommendations of the EAC, the Ministry of Environment, Forest and Climate Change hereby grants approval to the Terms of References for Subhadra Open Cast Mine with production capacity of 25 MTPA in mine lease area of 1111.85 ha of M/s Mahanadi Coal field Limited located at Village Gopal Prasad, Kumuda, Nisha, Kankarei, Raijharan, Nisha P.S Angul, Tehsil Tachler Sadar and Chhendipada, District Angul (Odisha), for preparation of EIA/EMP reports with public consultations, under the provisions of the Environment Impact Assessment Notification, 2006 and subsequent amendments/circulars thereto, subject to the compliance of the following terms and conditions as specified/notified in the standard ToR applicable for opencast coal mines, along with the additional conditions as under:-

Specific Conditions

(i) Public Consultation, including public hearing, shall be conducted through concerned SPCB as per the provisions/procedure contained in the EIA Notification, 2006 for information of the stakeholders about the present coal mining operations inviting comments and their redressal. All the issues raised and PP reply should be incorporated in EIA.

(ii) Stage-I Forest Clearance for diversion for non-forestry activity shall be submitted at the time of submission of EIA.

(iii) PP should submit the real time aerial footage and video of the Mining lease area made through drone with a special focus on the area adjacent to the rivers.

(iv) PP shall not divert the Singhada Jhor stream and will not disturbed the forest area or green patch located towards North eastern boundary for next 20 years of the mine life. Adequate protection measures shall be proposed in EIA Report. Accordingly, a distance of about 60 mts along Singhada stream shall be left to avoid any pollution, thus the Mine plan shall be revisited/relooked.

(v) A detailed hydrological survey of the Ghurdia nallah/Stream, regarding its catchment area, flow volume and length of the stretch to be diverted to be provided with proper diversion plan in EIA/EMP report.

(vi) A water reservoir and forest area is located towards South West directions so the extra measure adopted for combating the pollution should be mentioned in EIA/ EMP report.

(vii) PP shall clarify the area of the project with allotment of block from MoC and Mine Plan. Further, PP shall reduce the area of project implementation by excluding the green patch towards the North eastern boundary.

(viii) PP shall submit alternate land for grazing purpose with water bodies of same area within 5 km of project area.

(ix) PP shall prepare the Mining Plan in such a manner that condition prescribed by EAC shall intact from environment point of view. EIA-EMP shall accordingly be prepared on the suggested stipulation with point-wise compliance & in accordance with recommendations of Mining Plan

(x) In addition to existing data already collected (if any), the Cumulative Impact Assessment Study, ecosystem services study and biodiversity study of the area shall be carried over by project proponent. PP shall collect one season baseline data of all environmental parameters and shall compare with the data of earlier data collected for cumulative assessment of area. Air pollution impact predication shall be conducted by considering the maximum values.

(xi) PP shall explore the possibilities of utilization of OB material for different purposes (in construction of roads, manufacture of artificial sand, aggregates, use for farmers etc.) and accordingly Plan shall be included in EIA/EMP Report.

(xii) PP shall submit design details of all Air Pollution control equipment (APCEs) to be implemented as part of Environment Management Plan vis-à-vis reduction in concentration of emission for each APCEs.

(xiii) Inpit conveyor belt with silo loading should be proposed and installed for transportation of coal till railway siding. No transportation of coal by trucks/dumpers shall be proposed in EIA/EMP.

(xiv) No trucks or vehicles used for transportation of Coal to be passed by village roads or roads located near to the villages

(xv) PP has to adopt the adequate route or dedicated route causing least hindrance to existing traffic and its budgetary provision should also be provided in EIA report.

(xvi) PP to engage the adequate capacity of dumper size/trucks in order to reduce the fleet size.

(xvii) PP shall submit detailed project report for implementation of railway siding for evacuation of coal with its target date of completion. Target date should be such that railway siding should be operational within 2 years of commissioning of mine operations. Forest Clearance shall be submitted if railway siding land comes under forest land.

(xviii) Wind rose pattern in the area should be reviewed and accordingly location of AAQMS shall be planned by the collection of air quality data. Monitoring location for collecting baseline data should cover overall the 10 km buffer zone i.e. dispersed in 10 km buffer area.

(xix) Project proponent to prepare Environmental Cost Benefit Analysis for the project in EIA/EMP Report.

(xx) PP shall provide the details of mining technology/methodology proposed to be adopted for coal mining operations and its associated environmental benefits of using from Climate Change perspective by i.e. the likely emissions of greenhouse gases from the mining operations to be estimated with the modelling for future prediction related to the climate of that study area.

(xxi) Detailed Social Impact Assessment shall be prepared in villages for Rehabilitation and Re-settlement. R &R Activity shall be proposed with timeline and allotted fund with the approval of District Commissioner/collector.

(xxii) Permission for ground water withdrawal shall be obtained from Central Ground Water Authority (CGWA) only for mining activity.

(xxiii) Heavy metals including other parameters in surface water quality shall be analyzed and provided in EIA Report. Further, detailed mineralogical and chemical composition of the mineral and percentage of free silica from a NABL/MoEF&CC accredited laboratory

(xxiv) PP shall be submitting R &R in respect of SCs /STs and other weaker sections of the society in the study area, a need based sample survey, family-wise, should be undertaken to assess their requirements, and action programs prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government.

(xxv) PP should clearly bring out that what is the specific diesel consumption ~ (Liters/Tonne of total excavation & mineral) and steps to be taken for reduction of the same. Year-wise target for reduction in the specific diesel consumption needs to be submitted.

(xxvi) PP shall provide provision of integrated mine plan and mine reclamation cum land form / land scape plan for both underground and open cast coal mining projects. The plan must show the predicted post mining reclaimed and reformed surface by regarding and reshaping to reduce its height as close to the original surface level and proper sloping benching and terracing of external dup should be clearly brought out in the post mine closure plan. This would also include water management strategies such as surface water catchment and drainage paths etc. of post mining land surface. The final mine void shall be reduced and brought as near as ground so that land can be restored and reclaimed

(xxvii) PP shall propose to use LNG/CNG based mining machineries and trucks for mining operation and transportation of coal.

(xxviii) PP shall submit letter from PCCF that mine does not fall under corridors of any National Park and Wildlife Sanctuary and does not involve any violation of forest area and wild sanctuary with certified map showing distance of nearest sanctuary

(xxix) Details of toe wall and garland drain to be constructed along the OB dump.

(xxx) Reclamation to be done using geo-texturing technique of the dumps close to habitation and a cause of visual intrusion.

(xxxi) Impact of proposed project/activity on hydrological regime of the area shall be assessed and report be submitted. Hydrological studies as per GEC 2015 guidelines to be prepared and submitted.

(xxxii) PP should bring out the awareness campaign to be carried out on various Environmental issues, practical training facility to be provided to the environmental engineer/diploma holders, mining engineer/diploma holders, geologists, and other trades related to mining operations. Target for the same needs to be submitted.

(xxxiii)Details of Fog mist sprayer (static water sprinklers) at coal stock yard and along the permanent haul road.

(xxxiv)Details of black topping of permanent haul roads.

(xxxv) The PP should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyze the samples.

(xxxvi)The socio-economic study to conducted with actual survey report and a comparative assessment to be provided from the census data of 2011-part B to be provided in EIA/ EMP report also economic status of the study area and what economically project will contribute should be clearly mention. The study should also include the status of infrastructural facilities and amenities present in the study area and a comparative assessment with census data of 2011 part A to be provided and to link it with the initialization and quantification of need based survey for CSR activities to be followed.

(xxxvii) A detailed traffic study along with presence of habitation in 100 mts distance from both side of road, the impact on the air quality with its proper measures and plan of action with timeline for widening of road. The project will increase the no. of vehicle along the road which will indirectly contribute to carbon emission so what will be the compensatory action plan should be clearly spell out in EIA/ EMP report

4.1. This grant of Terms of References(ToR) for the said project is further subject to the general conditions as under

(i) All documents should be properly indexed, page numbered.

(ii) Period/date of data collection should be clearly indicated.

(iii) Authenticated English translation of all material provided in Regional languages.

(iv) After the preparation of the draft EIA-EMP Report as per the aforesaid TOR, the proponent shall get the Public Hearing conducted as prescribed in the EIA Notification 2006 and take necessary action for obtaining environmental clearance under the provisions of the EIA Notification 2006.

(v) The letter/application for EC should quote the Ministry's file No. and also attach a copy of the letter prescribing the ToR.

(vi) The copy of the letter received from the Ministry on the ToR prescribed for the project should be attached as an annexure to the final EIA-EMP Report.

(vii) General Instructions for the preparation and presentation before the EAC of ToR/EC projects

of Coal Sector should be incorporated/followed.

(viii) The aforesaid ToR has a validity of **Four** years only.

(ix) Grant of ToR does not necessarily mean grant of EC.

(x) Grant of ToR to the present project does not necessarily mean grant of TOR/EC to the captive/linked project.

(xi) Grant of ToR to the present project does not necessarily mean grant of approvals under the Forest (Conservation) Act, 1980 or the Wildlife (Protection) Act, 1972.

(xii) Grant of EC is also subject to circulars issued under the EIA Notification 2006, which are available on the Ministry's website: www.envfor.nic.in

5. Standard ToR: The EIA/EMP report should contain the information in accordance with provisions & stipulations as given in the standard ToR for Opencast coal mine projects (please visit the following link to download the Standard ToR:
http://environmentclearance.nic.in/writereaddata/standardtorreference.pdf

6. You are required to submit the final EIA/EMP prepared as per TORs to the Ministry within 4 years as per this Ministry's Notification vide S.O 751 (E) dated 17th February, 2020 for considering the proposal for environmental clearance.

7. The consultants involved in the preparation of EIA/EMP report after accreditation with Quality Council of India/National Accreditation Board of Education and Training (QCI/NABET) would need to include a certificate in this regard in the EIA/EMP reports prepared by them and data provided by other organization(s)/laboratories including their status of approvals etc. vide Notification of the MoEF dated 19th July, 2013.

(Lalit Bokolia)
Director

Copy to:

1. The Additional Principal Chief Conservator of Forests, Regional office (EZ), Ministry of Environment & Forests, A-31, Chandershekharpur, Bhubaneswar- 751023 (Odisha).
2. The Secretary, Department of Environment & Forests, Government of Orissa, Secretariat, Bhubaneswar (Odisha).
3. The Chairman, Orissa State Pollution Control Board, Parivesh Bhawan, A/118, Nilkanthanagar, Unit VIII, Bhubaneshwar - 751012 (Odisha).
4. District Collector, Angul, Government of Odisha.
5. Monitoring File /Record File 7. PARIVESH Portal

(Lalit Bokolia)
Director

A. Generic TOR for an opencast / UG coalmine project

(i) An EIA-EMP Report should be prepared for a peak capacity of …… **MTPA** over an area of …… ha addressing the impacts of the underground coalmine project including the aspects of mineral transportation and issues of impacts on hydrogeology, plan for conservation of flora/fauna and afforestation/plantation programme based on the generic structure specified in Appendix III of the EIA Notification 2006..Baseline data collection can be for any season except monsoon.

(ii) The EIA-EMP report should also cover the impacts and management plan for the project specific activities on the environment of the region, and the environmental quality – air, water, land, biotic community, etc. through collection of baseline data and information, generation of baseline data on impacts for ……. MTPA of coal production based on approval of project/Mining Plan.

(iii) A Study area map of the core zone and 10km area of the buffer zone (15 km of the buffer zone in case of ecologically sensitive areas) delineating the major topographical features such as the land use, drainage, locations of habitats, major construction including railways, roads, pipelines, major industries/mines and other polluting sources, which shall also indicate the migratory corridors of fauna, if any and the areas where endangered fauna and plants of medicinal and economic importance are found in the area.

(iv) Map showing the core zone along with 3-5 km of the buffer zone) delineating the agricultural land (irrigated and unirrigated, uncultivable land (as defined in the revenue records), forest areas (as per records) and grazing land and wasteland and water bodies.

(v) Contour map at 3m interval along with Site plan of the mine (lease/project area with about 3-5 km of the buffer zone) showing the various surface structures such as buildings, infrastructure, CHP, ETP, Stockyard, township/colony (within/adjacent to the ML), green belt and undisturbed area and if any existing roads, drains/natural water bodies are to be left undisturbed along with details of natural drainage adjoining the lease/project and modification of thereof in terms of construction of embankments/bunds, proposed diversion/rechannelling of the water courses, etc., highways, passing through the lease/project area.

(vi) Original land use (agricultural land/forestland/grazing land/wasteland/water bodies) of the area. Impacts of project, if any on the landuse, in particular, agricultural land/forestland/grazing land/water bodies falling within the lease/project and acquired for mining operations. Extent of area under surface rights and under mining rights.

S.N.	ML/Project Land use	Area under Surface Rights (ha)	Area Under Mining Rights (ha)	Area under Both (ha)
1.	Agricultural land			
2.	Forest Land			
3.	Grazing Land			
4.	Settlements			

5.	Others (specify)			

Area Under Surface Rights

S.N.	Details	Area (ha)	Forest Land	Agr. land	Wasteland	Settlements	Others
1.	Buildings						
2.	Infrastructure						
3.	Roads						
4.	Others (specify)						
	TOTAL						

(vii) Study on the existing flora and fauna in the study area carried out by an institution of relevant discipline and the list of flora and fauna duly authenticated separately for the core and buffer zone and a statement clearly specifying whether the study area forms a part of the migratory corridor of any endangered fauna. The flora and fauna details should be furnished separately for the core zone and buffer zone. The report and the list should be authenticated by the concerned institution carrying out the study and the names of the species scientific and common names) along with the classification under the Wild Life Protection Act, 1972 should be furnished.

(viii) Details of mineral reserves, geological status of the study area and the seams to be worked, ultimate working depth and progressive stage-wise working plan/scheme until end of mine life should be reflected on the basis of the approved rated capacity and calendar plans of production from the approved Mining Plan. Geological maps should also be included.

(ix) Impact of mining on hydrology, modification of natural drainage, diversion and channelling of the existing rivers/water courses flowing though the ML and adjoining the lease/project and the impact on the existing users and impacts of mining operations thereon.

(x) Collection of one-season (non-monsoon) primary baseline data on environmental quality – air (PM_{10}, $PM_{2.5}$, SO_x, NO_x and heavy metals such as Hg, Pb, Cr, AS, etc), noise, water (surface and groundwater), soil along with one-season met data.

(xi) Map of the study area (core and buffer zone) clearly delineating the location of various monitoring stations (air/water/soil and noise – each shown separately) superimposed with location of habitats, wind roses, other industries/mines, polluting sources. The number and location of the stations should be selected on the basis of the proposed impacts in the downwind/downstream/groundwater regime. One station should be in the upwind/upstream/non-impact non-polluting area as a control station. Wind roses to determine air pollutant dispersion and impacts thereof shall be determined. Monitoring should be as per CPCB guidelines and standards for air, water, noise notified under Environment Protection Rules. Parameters for water testing for both ground and surface water should be as per ISI standards and CPCB classification of surface water wherever applicable.

(xii) Impact of mining and water abstraction and mine water discharge in mine on the hydrogeology and groundwater regime within the core zone and 10km buffer zone including long–term modelling studies on the impact of mining on the groundwater regime. Details of

rainwater harvesting and measures for recharge of groundwater should be reflected wherever the areas are declared dark/grey from groundwater development.

(xiii) Study on subsidence, measures for mitigation/prevention of subsidence, modelling subsidence prediction and its use during mine operation, safety issues.

(xiv) Detailed water balance should be provided. The breakup of water requirement as per different activities in the mining operations, including use of water for sand stowing should be given separately. Source of water for use in mine, sanction of the competent authority in the State Govt. and impacts vis-à-vis the competing users should be provided.

(xv) Impact of choice of mining method, technology, selected use of machinery - and impact on air quality, mineral transportation, coal handling & storage/stockyard, etc, Impact of blasting, noise and vibrations.

(xvi) Impacts of mineral transportation – within and outside the lease/project. The entire sequence of mineral production, transportation, handling, transfer and storage of mineral and waste, and their impacts on air quality should be shown in a flow chart with the specific points where fugitive emissions can arise and the specific pollution control/mitigative measures proposed to be put in place. Examine the adequacy of roads existing in the area and if new roads are proposed, the impact of their construction and use particularly if forestland is used.

(xvii) Details of various facilities to be provided in terms of parking, rest areas, canteen, and effluents/pollution load from these activities. Examine whether existing roads are adequate to take care of the additional load of mineral and their impacts.

(xviii) Examine the number and efficiency of mobile/static water sprinkling system along the main mineral transportation road within the mine, approach roads to the mine/stockyard/siding, and also the frequency of their use in impacting air quality.

(xix) Impacts of CHP, if any on air and water quality. A flow chart of water use and whether the unit can be made a zero-discharge unit.

(xx) Conceptual Final Mine Closure Plan along with the fund requirement for the detailed activities proposed there under. Impacts of change in land use for mining operations and whether the land can be restored for agricultural use post mining.

Table 1 Stage-wise Cumulative Plantation

S.N	YEAR*	Green Belt		External Dump		Backfilled Area		Others (Undisturbed Area / etc)		TOTAL	
		Area (ha)	No. of trees	Area (ha)	No. of Trees	Area (ha)	No. of Trees	Area (ha)	No. of Trees	Area (ha)	No. of Trees
1.	1st year										
2.	3rd year										
3.	5th year										
4.	10th yr										
5.	15th yr										
6.	20th yr										
7.	25th yr										
8.	30th yr										
9.	34th year (end of										

	mine life)										
10	34-37th Year (Post-mining)										

*As a representative example

(xxi) Occupational health issues. Baseline data on the health of the population in the impact zone and measures for occupational health and safety of the personnel and manpower for the mine should be furnished.

(xxii) Details of cost of EMP (capital and recurring) in the project cost and for final mine closure plan. The specific costs (capital and recurring) of each pollution control/mitigative measures proposed in the project until end of mine life and a statement that this is included in the project cost.

(xxiii) Integrating in the Env. Management Plan with measures for minimising use of natural resources – water, land, energy, raw materials/mineral, etc.

(xxiv) R&R: Detailed project specific R&R Plan with data on the existing socio-economic status (including tribals, SC/ST) of the population in the study area and broad plan for resettlement of the displaced population, site for the resettlement colony, alternate livelihood concerns/employment for the displaced people, civic and housing amenities being offered, etc and costs along with the schedule of the implementation of the R&R Plan.

(xxv) CSR Plan along with details of villages and specific budgetary provisions (capital and recurring) for specific activities over the life of the project.

(xxvi) **Public Hearing should cover the details as specified in the EIA Notification 2006**, and include notices issued in the newspaper, proceedings/minutes of public hearing, the points raised by the general public and commitments by the proponent made should be presented in a tabular form. If the Public Hearing is in the regional language, an authenticated English Translation of the same should be provided.

(xxvii) Status of any litigations/ court cases filed/pending in any Court/Tribunal on the project should be furnished.

(xxxvi) Submission of sample test analysis of: Characteristics of coal - this includes grade of coal and other characteristics – ash, S and heavy metals including levels of Hg, As, Pb, Cr etc.

(xxxviii) Copy of clearances/approvals – such as Forestry clearances, Mining Plan Approval, NOC from Flood and Irrigation Dept. (if req.), etc.

(A) Forestry Clearance

Total ML / /Project Area (ha)	Total Forest Land (ha)	Date of FC	Extent of forest land	Balance area for which FC is yet to be obtained	Status of appl. for diversion of forestland
		If more than one, provide details of each FC			

(B) Mining Plan / Project Approval: Date of Approval of Mining Plan/Project Approval: Copy of Letter of Approval of Mining Plan/Project Approval

(xxxviii) Corporate Environment Responsibility:

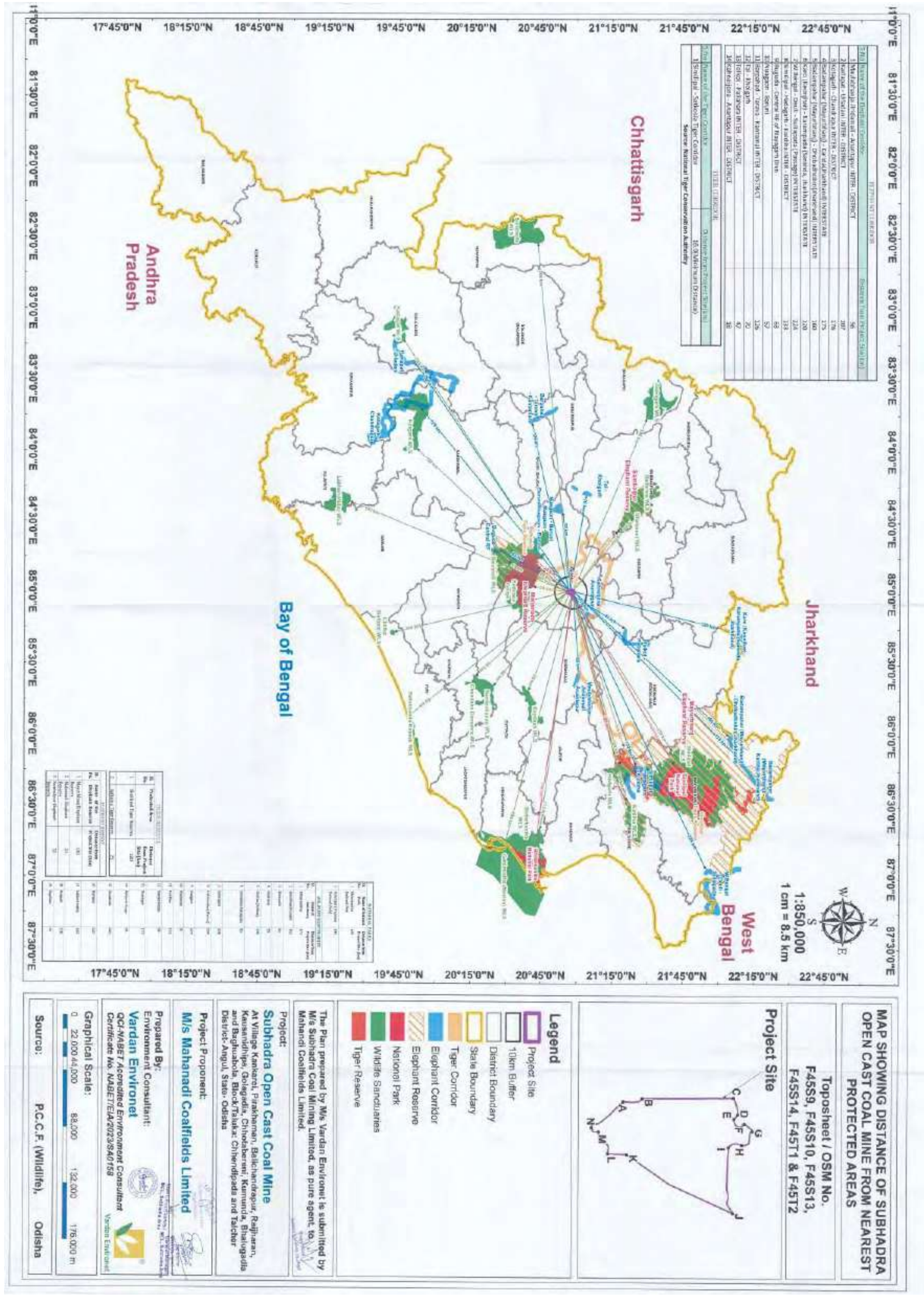
a) The Company must have a well laid down Environment Policy approved by the Board of Directors.

b) The Environment Policy must prescribe for standard operating process/procedures to bring into focus any infringements/deviation/violation of the environmental or forest norms/conditions.

c) The hierarchical system or Administrative Order of the company to deal with environmental issues and for ensuring compliance with the environmental clearance conditions must be furnished.

d) To have proper checks and balances, the company should have a well laid down system of reporting of non-compliances/violations of environmental norms to the Board of Directors of the company and/or shareholders or stakeholders at large.

ANNEXURE-II



MAP SHOWING DISTANCE OF SUBHADRA OPEN CAST COAL MINE FROM NEAREST PROTECTED AREAS
Toposheet / OSM No. F45S9, F45S10, F45S13, F45S14, F45T1 & F45T2
Project Site
Legend
Project Site
10km Buffer
District Boundary
State Boundary
Tiger Corridor
Elephant Corridor
Elephant Reserve
National Park
Wildlife Sanctuaries
Tiger Reserve
The Plan prepared by M/s. Vardan Environet is submitted by M/s Subhadra Coal Mining Limited, as pure agent, to Mahanadi Coalfields Limited.
Project:
Subhadra Open Cast Coal Mine
Project Proponent:
M/s Mahanadi Coalfields Limited
Prepared By:
Environment Consultant:
Vardan Environet
Graphical Scale:
Source: P.C.C.F. (Wildlife), Odisha
Chhattisgarh
Jharkhand
West Bengal
Andhra Pradesh
Bay of Bengal
1:850,000
1 cm = 8.5 km
N
S
E
W

adjacent Utkal-C and Utkal-B1 blocks, it is expected that this nala will be diverted at further upstream by owners of adjacent blocks.

Other small streams entering into the property from east are proposed to be diverted by Hingula Expansion OCP.

There are ponds and wells all around the property. One small reservoir towards south is shown in topographical map used for irrigation. With resettlement of villages, these will not be required anymore.

Water coming from outside property will be diverted without using to original destination, Singhada Jhor River. Settling pond is proposed just before release of water into the river.

8.3 Post Closure Water Quality Management

The development of the open pits, stockpiles, waste rock dumps, CHP and infrastructure often interrupt some of the natural drainage paths. Interference with drainage patterns may result in deprivation of water to drainage systems downstream of the mining developments or localised shadowing effects on some vegetation which may be reliant on intermittent flows. Furthermore, chemical reactions in waste rock have the potential to be detrimental to plant growth and to result in contamination of both surface and groundwater. In addition, mining and processing operations, transport, store and use a range of hazardous materials including fuels, process reagents, lubricants, detergents, explosives, solvents and paints. If these materials are not properly managed, they may have the potential to cause atmospheric, soil or water contamination and could potentially pose ongoing risks to human health and the environment.

In proposed project, Singada Jhor and other seasonal stream are flowing through mine boundary. It is therefore necessary to take proper diversion of stream during the operation so the downstream users may not be affected.

At the time of mine closure all the activity must have been stopped and hence chances of contamination are very less but it is again necessary to monitor the ground water quality and river water quality so that any change in quality can be detected.

8.3.1 Drainage arrangement for external OB dump

- **Catch Drain**

An open drain of appropriate size is provided on all terraces at the foot of next bench to receive the storm water from upper benches. This is then discharge to the lower benches through masonry chute, thus minimizing gully formation in the slope of external dump.

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- **Foot Drain**

A foot drain of proper size is provided around the external OB dump (portion exposed to outside only). This drain collects run-off from dump and direct it to settling tank/sedimentation pond before discharge to nearby natural watercourses.

8.3.2 **Drainage arrangement for internal OB dump**

- During working stage, the run-off is collected from internal dump by foot drain for diverting to mine sump for pumping.
- In the post-mining period, the drainage pattern of the reclaimed area will be such that the run-off will be diverted to final void of the quarry as a measure for water harvesting.

8.3.3 Post Closure Air Quality Management

Legislative Framework

Air quality is managed through a framework established under Environmental Protection Act 1986. There are two notification under which air quality standards are governed in coal mining area:

- Notification No. GSR 742(E), Dt: 25th September 2000 also known as coal mine standards
- Notification No. GSR 826(E), Dt: 16th November 2009 also known as National Ambient Air Quality Standard.

Since at the time of closure of mine, no mining activity is taking place, so, coal mine standard is not applicable and only NAAQS-2009 is applicable. In relation to the coal mine projects the key contaminant of concern is particulate matter. Relevant air quality objective in relation to particulate matter at sensitive receptor is PM_{10}<100 µg/m^3, $PM_{2.5}$<60 µg/m^3 respectively. Loose soil through wind erosion may only be the source of particulate matter at the time of closure. To deal with wind erosion problem, technical reclamation and biological reclamation of overburden (OB) is the best way. In biological reclamation of external OB dumps and internal OB dumps they are stabilized by covering and planting of native plants and grasses. The area must be regularly monitored at least monthly once to check the status of air quality in initial period of closure.

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8.4 Waste Management (Figures in Mcum) (Tentative)

Year/Stage (Life of the mine plus post closure period)		OB Removal (Cumulative)			External Dump (Cumulative)		Internal Backfilling (Cumulative)		Embankment (Cumulative)	
		Top soil	OB	Total	Top soil	OB	Top soil	OB	Top soil	OB
Up to Base Year*		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Y-1, Cons-1	2022-23	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Y-3, Prod-1	2024-25	0.84	9.81	10.65	0.84	9.57	Nil	0.24	Nil	Nil
Y-5, Prod-3	2026-27	1.56	49.76	51.32	1.52	33.92	Nil	15.88	0.04	0.15
Y-10, Prod-8	2031-32	1.61	202.16	203.77	1.35	87.49	0.22	114.71	0.04	0.15
Y15, Prod-13	2036-37	2.90	318.02	320.92	2.43	88.13	0.43	237.83	0.04	0.15
Y-20, Prod-18	2041-42	3.07	401.54	404.61	2.38	38.83	0.65	366.25	0.04	0.15
Y-25, Prod-23	2046-47	3.08	479.61	482.69	0.25	0.00	2.79	479.90	0.04	0.15
Y-30, Prod-28	2051-52	3.11	544.95	548.06	0.25	0.00	2.85	545.21	0.04	0.15
Y-36, Prod-34	2057-58	3.14	610.04	613.18	0.25	0.00	2.85	609.89	0.04	0.15
Post closure										
Y-39, PC-3	2060-61	3.14	610.04	613.18	0.00	0.00	3.10	609.89	0.04	0.15

8.5 Top Soil Management (Including Action plan for Top Soil Management) (Tentative):

(All Figures are cumulative and in MM^3)

Year/Stage (Life of the mine plus post closure period)		Top soil removal plan	Top Soil Used				
			Spreading over embankment	Spreading over backfill area	Spreading over external OB dump area	Used in Green Belt area	Total utilized
Up to Base Year*		Nil	Nil	Nil	Nil	Nil	Nil
Y-1, Cons-1	2022-23	0.00	0.00	0.00	0.00	0	0.00
Y-3, Prod-1	2024-25	0.84	0.00	0.00	0.00	0.00	0.00
Y-5, Prod-3	2026-27	1.04	0.04	0.00	0.55	0.00	1.11
Y-10, Prod-8	2031-32	1.61	0.04	0.22	0.90	0.00	1.16
Y15, Prod-13	2036-37	2.90	0.04	1.46	0.95	0.00	2.45
Y-20, Prod-18	2041-42	3.07	0.04	1.63	0.95	0.00	2.62
Y-25, Prod-23	2046-47	3.08	0.04	1.64	0.95	0.00	2.63
Y-30, Prod-28	2051-52	3.11	0.04	1.67	0.95	0.00	2.66
Y-36, Prod-34	2057-58	3.14	0.04	1.70	0.95	0.00	2.69
Post closure							
Y-39, PC-3	2060-61	3.14	0.04	2.15	0.95	0.00	3.14

No permanent external dump is proposed and temporary surface dump will be re-handled from Yr-13. Running stock of top soil at stock yard is 0.45 Mcum.

8.6 Management of Coal Rejects

There may be rejects from coal seams while extracting with surface miner. Quantity has not been estimated but percentage of such reject generated in adjacent Hingula mine is 8-9%. Such reject will be dumped in specified area within internal dump. Height of such reject stack will not be more than 10m. Such reject area will be quickly covered with other non-combustible OB material. Such stacks will not be continued more than 50m in the direction of backfilling advance. After filling with non-combustible OB for 100m, a new stack may be formed. Objectives of such operation are –

1. Prevent spontaneous combustion by not allowing such rejects to come in contact of air for long time
2. Prevent dump slope failure by not causing slippage plane to form

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भुवनेश्वर (ओडिशा)

8.7 Restoration of Land used for Infrastructure

Sl	Type of infrastructure	Status post final closure
1	Rail corridor of MCRL	This will be owned and maintained by separate companies and will continue to serve coal blocks at south-west area of the Talcher coal field. The siding lines will be dismantled.
2	Coal handling Plant	To be dismantled totally
3	Workshops & Stores	To be dismantled totally
4	Surface Roads	To be handed over to State Government in good condition who is supposed to maintain also.
5	Offices & ancillary buildings	As life of buildings are considered 60 years, these will be in useable condition. These may be handed over to any organization interested with acceptance of renovation and maintenance at their own expense
6	Electric poles, cables, sub-stations	These will be used by other nearby projects of MCL if suitable. Rest will be disposed of as per extant rules of the company.
7	Township	As life of buildings are considered 60 years, these will be in useable condition. These may be handed over to any organization interested with acceptance of renovation and maintenance at their own expense

8.8 Disposal of Mining Machinery

Disposal will be as per rules laid down by the holding company Coal India Limited, whose one subsidiary is MCL, who is owner of the mine.

8.9 Safety & Security

Measures to be implemented to prevent access to surface opening for underground working, excavation, etc.

8.10 Abandonment Cost and Financial Assurance

8.10.1 Abandonment Cost: Cost of Activities to be taken up for closure of the mine

	Head	Unit	Quantity	Rate Rs/unit	Amount "Rs Cr"
Progressive Closure	Drinking Water Quality Management for life of 36 years	No/Yr	36	9295	1.20
	Surface Water Quality Management	No/Yr	8	9551	0.28
	Effluent Water Quality Management	No/Yr	48	2387	0.41
	Water Quality Management Total				1.89
	Air Quality Management	No/Yr	96	37592	12.99
	Waste Management	Rs/cum	Regular activity, so not considered		
	Barbed Wire fencing around dump	Rs/m	Not proposed		
	Barbed wire fencing around the pit	Rs/m	13000	700	0.91
	Filling of void – Re-handling of crown dump	Rs/cum	23.99 Mcum	77	184.72
	Top soil management	Rs/cum	3.14 Mum	5.00	3.14
	Technical & Biological reclamation of mined out of land and OB dump	Rs/Ha	470.69	500000	23.53
	Plantation over virgin area including green belt	Rs/Ha	109.97	340000	3.74
	Manpower cost and supervision	Persns/Yr	11	400000	15.84
	Toe wall around the dump	Rs/m	9252	3300	3.05
	Garland drain	Rs/m	17464	4000	6.99

देवाशिस रॉय
भेहा प्रबंधक (उत्खनन)
विभागाध्यक्ष (यो.एवं.अ.)
सी.एम.पी.डी. आई, क्षे.सं-7

	Head	Unit	Quantity	Rate Rs/unit	Amount "Rs Cr"
	Garland drain around the dump	Rs/m	9252	4000	3.70
	Any other activity - River & Nala Diversion	Rs/m	6172	38577	23.81
Dismantling of infrastructure & disposal/rehabilitation of mining machinery	Dismantling of workshop	Rs/sqm	504401	630	32.20
	Rehabilitation of the dismantled facilities	To be sold as scrap			
	Dismantling of pumps and pipes / other facilities	Rs/sqm	3500	630	0.22
	Dismantling of stowing bunker, provisioning of pumps for bore well pumping arrangement		Not Required		
	Dismantling of UG equipment		Not Required		
	Rearranging water pipeline to dump top, park/agricultural land	LS	LS	LS	0.25
Safety & security	Barbed wire fencing around dump	Rs/m	Not proposed		
	Barbed wire fencing around the pit	0.91 crs as given above			
	Barbed wire fencing with masonry pillars	Rs/m	Not proposed		
	Concrete wall with masonry pillars around the pit	Rs/m	3867	3700	1.43
	Securing air shaft and bore well pump		Not Required		
	Securing of incline		Not Required		
	Concrete wall fencing around the water body		Not Required		
	Boundary wall around the water body		Not Required		
	Stabilization (viz benching, pitching etc) of side walls of the water body		Not Required		
	Toe wall around the dump	3.05 crs as given above			
	Garland drain	0.40 crs as give above			
	Garland drain around the dump	4.06 crs as given above			
	Drainage channel from main OB dump	Rs/m	500	4000	0.20
Technical & biological reclamation of mined out land and OB dump	Filling of void	No proposal to bring OB from outside			
	Top soil management	Rs.38.00 crs as given above			
	OB re-handling for backfilling	Rs.474.71 crs as given above			
	Terracing, blanketing with soil and vegetation of external dump	LS			2.75
	Peripheral road, gates, view point, cemented steps on bank	LS			5.00
	Expenditure on development of agricultural land	LS			5.00
	Landscaping and plantation	Rs/ha	300	500000	15.00
Post closure management and supervision	Power cost	Rs/kW/Yr	300	26000	2.34
	Post mining Surface water quality management	No/Yr	8	9551	0.02
	Post mining Effluent water quality management	No/Yr	48	2387	0.03
	Total of water quality management				0.05
	Post mining air quality management	No/Yr	96	37592	1.08
	Subsidence monitoring for 5 years		Not Required		
	Waste management (levelling, grading, plantation)	Rs/ha	300	1500000	45.00
	Filling of void – Re-handling of crown dump	Rs/cum	37.66 Mcum	77	289.98
	Manpower cost and supervision	Rs/Pers/Yr	25	400000	3.00
Others	Entrepreneurship development (vocational/skill development training) for sustainable income of affected people	Rs/Pers	148	100000	4.75
	Golden handshake/retrenchment benefits to 100 employees of OC	MDO mode of mine operation, Company staff will be re-deployed in other facilities of MCL			
	Golden handshake/retrenchment benefits to 200 employees of UG		Not Required		

14/5/23
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	Head	Unit	Quantity	Rate Rs/unit	Amount "Rs Cr"
	Onetime financial grant to societies/institutions/organizations which is dependent on the project	Rs/Inst/Org	14	500000	0.70
	Provide jobs in other mines of the company	Own staff to be retained and re-deployed			
	Continuation of other services like running of schools etc.	Rs/Sch/Yr	1	500000	0.50
TOTAL					693.54

8.10.2 Financial Assurance: Amount to be deposited in Escrow account

(As a security against the mine activities to be carried out for the closure of the mine)

WPI as on	Apr-19		121.1
WPI as on base date-extrapolated	Apr-22		126.3
Escalated rate of Closure cost			1.0429
		UG	OC
Base Rate of Closure Cost "Rs, Crs./Ha"			0.0900
Closure Cost "Rs, Crs./Ha"			0.0939
Project Area "Ha"			1111.85
Amount to be deposited into Escrow Account "Rs, Crs."			104.3594
Amount already deposited in Escrow Account "Rs, Crs"			0.00
Net Amount to be deposited in Escrow Account "Rs, Crs."			104.3594
Rate of compounding of Annual Closure Cost			5.00%
Balance Life of the project "in Yrs"			36
Annual Closure Cost "Rs. Cr."			2.8989
"In Crs"			277.82

Year	OC	Year	UG	Total
Rupees in Lakhs				
1	289.8871			289.8871
2	304.3815			304.3815
3	319.6006			319.6006
4	335.5806			335.5806
5	352.3596			352.3596
6	369.9776			369.9776
7	388.4765			388.4765
8	407.9003			407.9003
9	428.2953			428.2953
10	449.7101			449.7101
11	472.1956			472.1956
12	495.8054			495.8054
13	520.5957			520.5957
14	546.6255			546.6255
15	573.9568			573.9568
16	602.6546			602.6546
17	632.7873			632.7873
18	664.4267			664.4267
19	697.6480			697.6480
20	732.5304			732.5304
20	732.5304			732.5304
22	807.6147			807.6147
23	847.9954			847.9954
24	890.3952			890.3952
25	934.9150			934.9150
26	981.6608			981.6608
27	1030.7438			1030.7438
28	1082.2810			1082.2810
29	1136.3951			1136.3951
30	1193.2149			1193.2149
31	1252.8756			1252.8756
32	1315.5194			1315.5194
33	1381.2954			1381.2954
34	1450.3602			1450.3602
35	1522.8782			1522.8782
36	1599.0221			1599.0221
Total	27781.7189			27781.7189

14/5/23
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सी.एम.पी.डी.आई, क्षे.सं-7
भुवनेश्वर (ओडिशा)

Annexure-IV

Proposed Cost Norm for Dense Plantation through Miyawaki Technique for 1 Ha. @ Wage Rate Rs. 450/- per MD

					Wage Rate	450.00
Sl. No	**Head of Account**	**Period of Execution**	**Unit**	**Quantity / Labour in MD**	**Labour Cost in Rs.**	**Material Cost in Rs.**	**Total Cost in Rs. per Ha.**
1	**2**	**3**		**4**	**5**	**6**	**7**
	0th Year & 1st Year						
1	Cost of seedlings for 1 Ha = 10000 Sq. Mtr for planting a a spacing of 1 mtr. X 1 mtr. with Inspection Path iside (8800 nos., 1 &1/2 year seedlings including 10% for CR Planting)						
	Total = 8800 Nos.@ Rs. 67.6155/- per seedlings		Nos.	8800	493020.00	101996.40	595016.40
2	Survey, Demarcation & Preparation of Map		MD	2	900.00	-	900.00
3	Marking of Planting Points (1 mtr. X 1 mtr.)		MD	10	4500.00	-	4500.00
4	Soil Testing and Chemcial Analysis		LS	-	-	5000.00	5000.00
5	Site Preparation		MD	12	5400.00	-	5400.00
6	Charges for digging up continuous trench upto a depth of 2' by help of JCB @ Rs. 147.73/- per Cum. over 3000 Cum. (100 mtr. X 100 mtr. X 0.6 Cum.) (Rs. 147.73 X 6000 Cum.)		Cum.	6000	-	886380.00	886380.00
7	Mixing up existing Soil with Sand, CDM, Organic Insecticides and preparation of raised bed						
i.	Cost of CDM = 430 Cum.		Cum.	430.00	-	285714.00	285714.00
ii	Cost of Sand = 430 Cum.		Cum.	430.00	-	166100.00	166100.00
iii	Cost of Bio Insecticide (LS) @ Rs. 40 per Kg.		Kg.	800.00	-	32000.00	32000.00
iv	Labour Charge for mixing @ 20 MD per Ha.		MD	20	9000.00	-	9000.00
8	Carriage & Planting @ 15 MD per 1000 Nos. including application of bio fertilizer, Bazal Dose		MD	120	54000.00	-	54000.00
9	Mesh Fencing over 400 Rmt. @ Rs. 940 per Rmt.		Rmt.	400	-	376000.00	376000.00
10	Cost of Rice Husk including Transporting Cost @ Rs. 16000 per 560 Sqft. excluding Inspection Path 1000 Sqft.		Sq.Ft.	8000	-	228570.00	228570.00
11	Spreading of Rice Husk inside Planting Area (1 Labour for 500 Sq.Mtr.)		MD	20	9000.00	-	9000.00
12	Soil Working & Application of Bio Fertilizer		MD	35	15750.00	-	15750.00
13	Cost of Bio Fertilzer (Vermi Compost) @ 100 gm. per plant @ Rs. 20/- per Kg.		Kg.	800	-	16000.00	16000.00
14	Fire Protection Measures		MD	15	6750.00	-	6750.00
15	Watering November to March @ Rs. 89.40/- per plant over 8000 plants @ 10 days per month		Nos.	8000	-	715200.00	715200.00
16	Watch and Ward for 9 months (July to March) 540 Days		MD	540	2,43,000.00		243000.00
17	Contingency for Sign Board		LS		-	10000.00	10000.00
	TOTAL				**841320.00**	**2822960.40**	**3664280.40**
18	Add 5% for Monitoring & Supervision				-	183214.02	183214.02
	Grand Total 0th Year & 1st Year				**841320.00**	**3006174.42**	**3847494.42**
	2nd Year Maintenance						
1	Casualty Replacement (10 %)						
i	**Cost of 10% = 800 nos. of Seedlings @ Rs. 67.6155/- per seedlings**		Nos.	800	44820.00	9272.40	54092.40
ii	Pitting & Replacement		MD	10	4500.00	-	4500.00
2	Soil Working = 17.5 MD & Manuring = 17.5 MD		MD	35	15750.00	-	15750.00
3	Cost of Bio Fertilzer (Vermi Compost) @ 100 gm. over 8000 plants @ Rs. 20/- per Kg.		Kg.	800	-	16000.00	16000.00
4	Maintenance of Fencing = 400 Rmt. @ 50/- per Rmt.		Rmt.	400	-	20000.00	20000.00
5	Watering 5 days per month from November to March & April to June @ Rs. 71.52/- per plant		Nos.	8000	-	572160.00	572160.00
6	Fire Protection Measures		MD	15	6750.00	-	6750.00
7	watch and Ward for whole year		MD	720	3,24,000.00		324000.00
8	Contingency (Sign Board Repair & Photography)		LS		-	5000.00	5000.00
	TOTAL				**395820.00**	**622432.40**	**1018252.40**
9	Add 5% for Monitoring & Supervision					50912.62	50912.62

Sl. No	Head of Account	Period of Execution	Unit	Quantity / Labour in MD	Labour Cost in Rs.	Material Cost in Rs.	Total Cost in Rs. per Ha.
	Grand Total 2nd Year Maintenance				**395820.00**	**673345.02**	**1069165.02**
	3rd Year Maintenance						
1	Soil Working		MD	35	15750.00	-	15750.00
2	Maintenance of Fencing = 400 Rmt. @ 100/- per Rmt.		Rmt.	400	-	40000.00	40000.00
3	Spreading of Rice Husk on Top Layer		Sqft.	8000	-	234296.00	234296.00
4	Fire Protection Measures		MD	15	6750.00	-	6750.00
5	watch and Ward for whole year		MD	720	3,24,000.00		324000.00
	TOTAL				**346500.00**	**274296.00**	**620796.00**
6	Add 5% for Monitoring & Supervision					31039.80	31039.80
	Grand Total 3rd Year Maintenance				**346500.00**	**305335.80**	**651835.80**
	4th Year Maintenance						
1	Maintenance of Fencing = 400 Rmt. @ 100/- per Rmt.		Rmt.	400	-	40000.00	40000.00
2	Fire Protection Measures		MD	15	6750.00	-	6750.00
3	watch and Ward for whole year		MD	720	3,24,000.00		324000.00
	TOTAL				**330750.00**	**40000.00**	**370750.00**
4	Add 5% for Monitoring & Supervision				-	18537.50	18537.50
	Grand Total 4th Year Maintenance				**330750.00**	**58537.50**	**389287.50**
	Grand Total Project Cost				**1914390.00**	**4043392.74**	**5957782.74**

Abstract		
Year of Maintenance		**Amount**
1st Financial year	Rs.	3847494.42
2nd Financial year	Rs.	1069165.02
3rd Financial year	Rs.	651835.80
4th Financial year	Rs.	389287.50
Total		**5957782.74**

Say OR Rs. 59,57,800/- per ha

By fax/E-mail 553

CCF (CAMPA)

PRINCIPAL CHIEF CONSERVATOR OF FORESTS
ODISHA, BHUBANESWAR
25 MAY 2020
Receipt No. 17195
Sec.

GOVERNMENT OF ODISHA

FOREST & ENVIRONMENT DEPARTMENT

*****

No. FE-DIV-MISC-0007-2018-3872 /F&E, Date 19.02.2020

10F(Con) 87/2018

From

Sri Debidutta Biswal, IFS

Special Secretary to Government

To

The Chief Executive Officer, CAMPA

O/o the Principal Chief Conservator of Forests, Odisha,

Bhubaneswar.

Sub: Proceedings of the 17th Meeting of State Level Steering Committee of Compensatory Afforestation Fund Management and Planning Authority (State Authority), Odisha held on 11.02.2020 at 12.45PM in the 2nd Floor, Conference Hall of Lokseva Bhawan under the Chairmanship of Chief Secretary, Odisha.

Sir,

I am directed to invite a reference to the subject cited above and to enclose herewith approved copy of proceedings of the 17th Meeting of State Level Steering Committee of Compensatory Afforestation Fund Management and Planning Authority (State Authority), Odisha held on 11.02.2020 at 12.45PM in the 2nd Floor, Conference Hall of Lokseva Bhawan under the Chairmanship of Chief Secretary, Odisha with a request to circulate the same to all concerned.

Yours faithfully

19/02/2020

Special Secretary to Government

P. T. O.

Memo No. 3873 /F&E, Date 19.02.2020

Copy with copy of the enclosures as above forwarded to the Principal Chief Conservator of Forests, Odisha, Bhubaneswar for information & necessary action.

19/02/2020
Special Secretary to Government

Memo No. 3874 /F&E, Date 19.02.2020

Copy with copy of the enclosures as above forwarded to the PS to Additional Chief Secretary, Forest & Environment Department for kind information of Additional Chief Secretary.

19/02/2020
Special Secretary to Government

Proceedings of the 17th Meeting of State Level Steering Committee of Compensatory Afforesation Fund Management and Planning Authority (State Authority), Odisha held on 11.02.2020 at 12.45 PM in the 2nd Floor Conference Hall of Lokaseva Bhawan under the chairmanship of the Chief Secretary, Odisha.

***

The meeting was presided over by the Chief Secretary, Odisha & Chairperson, State Level Steering Committee of the Compensatory Afforestation Fund Management and Planning Authority (State Authority), Odisha. The members of Steering Committee who attended the meeting are at ***Annexure-I***.

The meeting started with the welcome address by the Principal CCF & HoFF, Odisha. While highlighting the actions taken on the proceedings of the last meeting, the Principal CCF & HoFF informed the house that all observations have been duly complied. Addl Chief Secretary highlighted the developments taken in CAMPA especially formation of State Authority, fund position in CAMPA, broad frame work of the APO 20-21.

With the permission of the chair, the Chief Executive Officer, State Authority, Comp. Affn. Fund, Odisha made a brief Presentation on the agenda items.

Proposals of APO 2020-21

A. ***Fund position*** **:**

The Chief Executive Officer informed the committee on the fund position available with State Authority. Pursuant to Provisions of Rule 39 of CAF Rules, 2018, the APO 2020-21 has been formulated by the State Authority. The present fund position is given below:

Amount Received from National Authority after reconciliation upto 07.02.2019	Rs.5933.89 Cr
Amount deposited by User Agencies from 08.02.2019 to 31.10.2019	Rs.271.82 Cr
Total:	**Rs.6205.71 Cr**
Amount Budgeted for APO 19-20 (-)	Rs.600 Cr
Balance:	**Rs.5605.71 Cr**
Interest Accrued from treasury bill investment as estimated by 05.03.2020	Rs.143.63 Cr

Total Fund Available: Rs.5748.34 Cr

(b) Details of Area under Compensatory Afforestion:

Total area diverted upto Sep 2019	55534.3998 ha
Stipulation of Comp Affn upto Sept 2019	72606.5706 ha
Achievement upto Sep 2019	64135.268 ha
Balance Area to be covered	8471.3026 ha
Proposed area for Comp. Affn in APO 2020-21	4355.35 ha
Area to be covered in APO 2021-22	4000 ha

(c) Details of Outlay of APO 20-21:

1. **CA, PCA**:

The Chief Executive Officer informed the committee that under this APO, a budget provision of Rs.75.01 Crore is required to take up 237.64 ha Block Plantation (AR), 2548.08 ha ANR with gap, 458.68 ha ANR without gap, 974.724 ha Bald Hill, 5050 Nos. saplings plantations, ancillary works in 146.83 ha and 2nd, 3rd, 4th, 5th & 6th year maintenance of previous years plantations and preliminary operations for 21-22 plantations.

2. Regional WL Management & Site Specific WL Conservation Plan:

Funds have been provisioned for implementation of Regional Wildlife Management Plan and implementation of Site Specific Wildlife Conservation Plan (9 new site specific plans and 74 ongoing plans) to the tune of Rs.5.00 Crore and Rs.31.42 Crore respectively.

3 **Under 80% of NPV:**

A. ***PLANTATION ACTIVITIES:***

Plantations over an area of 44050 ha will be taken up in APO 2020-21 with financial outlay of Rs.149.21 cr. Details are as follows:

Block Plantation -	1500 Ha.
Bald Hill Plantation-	1000 Ha.
Fodder and fruit bearing species plantation-	550 Ha.

Bamboo plantation @400 / Ha. - 1000 Ha.

ANR with Gap - 40,000 Ha.

555

Total: 44050 Ha.

B Apart from plantations, Bamboo SSO over 75,000 ha and SMC over 6,650 ha activities will be taken up with financial outlay of Rs.17.88 crore & Rs.20.62 crore respectively in this APO. Maintenance of old plantations will also be taken up with an outlay of Rs.62.56 crore.

C Wildlife Management :

(i) Wildlife Management activities like relocation of villages from protected areas, animal rescue center, wood-saving cooking appliances, management of biological diversity and resources, distribution of fuel saving devices etc. in the wildlife areas will be carried out exclusively. A provision of Rs.20.25 Crore has been made in this APO

(ii) creation and maintenance of meadow, rejuvenation of wildlife corridors, creation of water body, maintenance of old plantations, etc. has been provisioned at a outlay of Rs.18.61 Crore.

(iii) SMC works like LBCD, staggered trench, graded bund, WHS etc. under Wildlife has been kept at Rs.6.42 Crore

(iv) Protection of Wildlife habitats through deployment of anti-depredation squad, equipments, mobility, erection trench and fence, etc. at Rs.49.32 Crore.

(v) For protection from fire in **Wildlife Divisions,** the outlay for Rs.6.47 Crore has been made for fire squads, equipments, fire line etc.

Thus for wildlife habitats a provision of Rs.101.07 Cr has been made under 80% NPV.

D Ama Jungle Yogana: This is a VSS based plantation and protection activity being proposed in 23 divisions covering 580 Vana Samrakshna Samithies with an outlay of 72 Cr.

E FOREST PROTECTION:

(i) Forest Protection is one of the key interventions under CAMPA. The main activities proposed in this category are deployment of Forest Protection Squads in 32 vulnerable sites in 24 Divisions. Provision of Coordination cells to ensure the protection at State Headquarters to receive and transmit the information from Divisions and different parts of the State and transmission of the same to

appropriate quarters for taking immediate necessary action by the field functionaries have been made with a total of Rs.9.29 Crore

(ii) Fire Protection: For management of forest fire in the state, 216 squads are proposed to be deployed in 37 Forest Divisions. It includes creation and management of fire lines, awareness programs for the people living in the immediate vicinity of the forest to protect the forest from fire, etc. An amount of 21.84 Cr. is proposed under fire protection.

(iii) **Involvement of VSS in Forest Protection**: This is a new activity proposed in the Plan to incentivize the VSS who are doing exceptional work for forest protection. Under this an amount of 10 Cr is proposed. A total outlay of 41.14Cr has been made for protection.

4. ACTIVITIES UNDER 20% OF NPV FUND

A. *INFRASTRUCTURE DEVELOPMENT:*

The requirement of Infrastructure development of the Deptt. is highly essential for growing of nurseries, accommodation of frontline staff and their movement in management of forest and wildlife. Hence, the provisions made in the present APO include maintenance of Mega/Permanent nurseries, construction of Range Offices, Range Officer's residence, Forester & Forest Guard quarters, Seizure yard, construction of Boundary wall, Forest Road, Culvert, Cause Way and tube-well for drinking water facility. A budget of **Rs. 56.01 Cr.** has been earmarked under the component infrastructure development.

Under **Wildlife,** for strengthening communication facilities, construction of infrastructure for protection of wildlife, an amount of **Rs.16.18 crore** has been made in this APO.

Thus, a total provision of **Rs. 72.19 Crore** under Infrastructure Development has been made in this APO.

B. *RESEARCH:*

The main activities proposed under Research are production of QPM, maintenance of plus trees (old), ex-situ conservation of *Mesua ferrea*, maintenance of *Santalum album* plantation with different host species, maintenance of hi-tech nursery and other nursery, creation of sample plots in RET seedling plantation, logistic support for research activities, for this an outlay of **Rs.2.20 Cr** is proposed in APO 2020-21.

Under **Wildlife,** conservation, sustainable use and documentation of biodiversity, preservation of habitat etc., an amount of **Rs.1.5 crore** has been made in this APO.

Thus, a total provision of **Rs. 3.70 Crore** under Research has been made in this

APO.

C. ***DEVELOPMENT OF TRAINING CAPACITY OF TRAINING COLLEGE/SCHOOLS:***

As regards training of frontline staff in Odisha Forest Rangers College, Angul, Forester's Training Schools at Bhubaneswar, Champua and G. Udayagiri, a provision of **Rs.4.00 Cr.** has been proposed for development campus, procurement of training equipment and for the training programmes.

D. ***CAPACITY BUILDING:***

To develop capacity building of the frontline staff, training programmes in different divisions are being conducted by resource persons to update the skill of Scientific Management of Forest & Wildlife for which a provision of **Rs.1.00 crore** has been kept in this APO.

Under **Wildlife,** awareness, training and capacity building, an amount of **Rs.0.75 crore** has been made in this APO.

Thus, a total provision of **Rs. 1.75 Crore** under Capacity Building has been made in this APO.

E. ***FOREST IT & GEOMATICS AND WORKING PLAN EXERCISE:***

CAMPA funds are being utilized for digitization of delivery process of governance. A website for forest organization has already been developed to facilitate smooth up-gradation of Forest IT. Digitization of forest boundary is going on in different Divisions. The financial outlay for the above purpose under APO 2020-21 has been kept at **Rs.20.00 crore.**

F. ***MONITORING & EVALUATION:***

At present the Forest Range Officers are over burdened with multifarious works like implementing different schemes, uploading data in e-Green watch, CAMPA tracker & accounting, monitoring of the said schemes etc. For the above works one support staff who is well conversant with data management and analysis is essential for each Range Office.

As per CAMPA guidelines, all the activities of previous operations carried out under CAMPA are being monitored and evaluated by an independent 3rd party organization to assess the quality of works already undertaken as well as effective utilization of funds.

As per Campa rules, there will be a robost internal monitoring for the activities that will be taken up in 2020-21. For this, a provision of **Rs.5.00 crore** has been kept in APO 2020-21.

Under **Wildlife,** provision for monitoring and evaluation, an amount of **Rs.0.50 crore** has been made in this APO.

Thus, a total provision of **Rs. 5.50 Crore** under Monitoring and Evaluation has been made in this APO.

UTILIZATION OF INTEREST MONEY:

The Chief Executive Officer apprised the committee about the utilization of interest money. As per Rule 6 (a) & (b) of CAF Rule 2018, the interest accrued on monies in State Fund shall be used i.e. not less than 60% towards conservation and development of forest and wildlife, plantation & protection related activities & not more than 40% for development and management of state authority office, procurement of office equipment and other contingencies of State Authority. Accordingly, the following activities have been included in the present APO.

UNDER 60% ACTIVITY.

Special Project:

a. **Miyawaki Plantation:**

This is a Japanese technique of raising plantation in a highly degraded forest land. The plantation of Indigenous Forest Species is taken up in close spacing of 1mt X 1mt. The plantation is designed in such a manner that the different canopy cover is maintained so as to produce maximum biomass and species diversity. An area of 3.5 Ha. has been identified in 4 divisions , namely Malkangiri, Koraput, Kalahandi North and Sambalpur Divisions for **Rs.1.30 crore**.

b. **Sowing of Bamboo Seed:**

To augment fodder availability for wildlife and restocking the forests, it has been proposed to sow 1030 Ha. with Bamboo seeds with an outlay of **Rs. 0.25 Cr.**

c. **Orchidarium:**

Similipal Forest is the home of a number of rare Orchids. Due to effect of climatic change and other anthropogenic factors the species are depleting fast. In order to conserve this, 3 sites have been identified in Similipal and is proposed to take up the same with budget outlay of **Rs.0.30 Cr**. The Executive Committee allowed to take up 1 site at Patabill in Similipal with intensive interventions at Rs.0.30 crore.

d. **Protection and Conservation of Pure Strand & RET species**

Some species like Bandhan, Piasal, Rakta Chandan, Chandan, Siali, etc. were in abundance. Due to many climatic and anthropogenic reason the number of such plants have been depleted drastically and now available in degraded state in pockets. In order to improve their status, 12 sites in the state have been identified over an area of 884 Ha. which include 85 ha under ANR gap and 799 ha ANR without gap with vegetative fencing around the targeted areas for their protection and management. Provision for the same has been kept at **Rs.2.37 Cr**.

e. **Raising of Root Trainer Seedling:**

Production of Quality Planting Materials (QPM) adopting scientific and technical method not only meet the demand of Forest Plantation but also reduce the inputs, time. The technique is eco-friendly and use of traditional poly-pots are avoided. Proposal of raising 16.50 lakh seedlings in 11 no. of identified High-Tech Nurseries have been included in this APO at Dhenkanal, Athgarh, Khurda (2), Puri WL, Sambalpur, Athmallik, Kalahandi North, Rajnagar WL (2) and Nayagarh divisions, with a financial layout of **Rs. 2.20 Cr.**

f. **Raising of 18 months old Seedlings:**

The success of plantation mainly depends upon the quality of planting materials. If the seedlings are tall, sturdy and seasoned, the rate of success will be maximum. Keeping in view, it has been proposed to raise 2.0 Cr. seedlings in different permanent Nurseries of the State which shall be used in plantation during 2021-22. An amount of **Rs.36.64 Cr** has been kept for the purpose.

g. **Distribution of Seedlings:**

The distribution of seedlings to the farmers, Institutions, Urban bodies, Panchayat, in past years have significantly helped in increasing tree cover outside forest. To continue the tree plantation initiative by general public raising and distribution of 1.0 Cr. seedlings have been included in APO 2020-21 with an outlay of **Rs.13.10 Cr**.

Para Forest Squad:

To improve the protection scenario of the Forest it has been proposed to engage 195 no. of para protection squads comprising 10 local youth per squad for 12 months with an outlay of **Rs.28.31 crore.**

Strengthening of mobility in all Forest Ranges for protection:

To strengthen the mobility of forest rangers and frontline staffs it has been proposed to engage hired vehicle in 219 ranges having no Govt. vehicles and to make provision for driver and POL in 70 ranges where there is Govt. vehicle. For this purpose, an amount of **Rs.13.13 crore** has been kept in this APO.

Offsetting wage rate enhancement

To offset the escalated expenditure in compensatory afforestation and related activities due to enhancement of wage rate as per provision under rule 6(a) (i), an amount of **Rs.3.00 crore** is kept for the purpose.

UNDER 40% ACTIVITY :

Interest money amounting Rs.20.00 Cr out of accrued interest has been proposed for the following activities:

i. An amount of **Rs.15.00 Cr.** has been proposed for completion of State Capacity Building Centre (Forest Academy) started under CAMPA APO 2019-20.

ii. Further, an amount of **Rs.5.00 Crore** has been proposed to meet the Contingency expenditure of State Authority during the next financial year.

The State Level Steering Committee, after due deliberations, approved the Annual Plan of Operation 2020-21. Details of activities vis-à-vis financial outlay under the APO is furnished hereunder.

Sl. No.	Component of Work	Financial Outlay (Rs. in Cr.)		
		Forest	Wildlife	Total
1	**CA, Addl.CA, PCA, SZ, 1.5 SZ etc**	**75.01**	**0**	**75.01**
2	**Integrated Wildlife Management Plan**	0		**36.42**
	(i) Regional Wildlife Management Plan	0	5.00	
	(ii) Site Specific Wildlife Conservation Plan	0	31.42	
Net Present Value (NPV)				
	80% Activities			

5	Bamboo SSO	17.88	0	17.88
6	Soil & Moisture Conservation	20.62	6.42	27.04
7	Forest Protection	41.14	55.79	96.93
8	Wildlife Management	0	20.25	20.25
9	Ama Jangala Yojana	72.00	0	72.00
	Total 80%	**363.41**	**101.07**	**464.48**
	20% Activities			
10	Infrastructure Development	56.01	16.18	72.19
11	Research and Development	2.20	1.50	3.70
12	Devt. of Training capacity of Training College/Schools	4.00	0	4.00
13	Capacity Building	1.00	0.75	1.75
14	Forest IT & Geomatics	20.00	0	20.00
15	Monitoring & Evaluation	5.00	0.50	5.50
	Total 20%	**88.21**	**18.93**	**107.14**
	TOTAL NPV -	**451.62**	**120.00**	**571.62**

Proposal for Utilisation of Interest money

(As per Rule 6 (b) of CAF, Rule 2018)

I	**Under 60% Activities**	Financial outlay (Rs. in Crore)
1	1. Miyawaki Pln. – 3.5 Ha., 2. Sowing of bamboo seeds over 1030 ha 3. Orchidarium – 1 site, 4. Protection of pure strand & RET species – 85 ha ANR with gap, 799 ha ANR without gap with fencing 5. Root-trainer seedling – 16.5 lakh, 6. Raising of 2 cr no. 18month old seedling for plantation 2020-21, 7. Distribution of 6month old seedling- 1cr no.	56.16
2	Para Protection Squad engaging local youth 195 squads.(10 person in each squad)	28.31
3	Strengthening of Range Office for protection through provision of transportation	13.13
4	Offsetting the escalated expenditure due to wage rate enhancement	3.00

	TOTAL 60% Activities -	**100.60**
II	**Under 40% Activities**	
1	Construction of State Capacity Building Centre	15.00
2	Expenses for State Authority	5.00
	Total 40% Activities -	**20.00**
	TOTAL INTEREST	**120.60**
	Grand Total APO	**803.65**

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Abstract of outlay of APO 2020-21

Sl.No	Component	Financial Outlay (Rs. in cr.)
1	CA, PCA etc.	75.01
2	i. Regional Wildlife Management Plan	5.00
	ii. Site Specific WL Management Plan	31.42
3	NPV (80% + 20%)	571.62
4	Utilisation of Interest Money (60% + 40%)	120.60
	GRAND TOTAL:	**803.65**

1. **Changes in APO 2019-20**

There has been no change in financial outlay of APO 2019-20. However, the Chairman of the Executive Committee of State CAMPA has allowed the following for inclusion in the APO.

i. Avenue Plantation (Jal Shakti Abhiyan) in Cuttack Forest Division over 76 RKM with financial outlay of Rs.93.57 lakhs, as a measure to recharge ground water to combat the drought situation in Kendrapara district.
ii. Odisha was affected by a severe cyclonic storm "Fani" during the month of May, 2019 in which the Konark – Balukhand Wildlife Sanctuary of Puri Wildlife Division was severely devastated. In order to restore the greenery and the wildlife habitat, ANR plantation over 400 ha with financial outlay of Rs. 96.76 lakhs.
iii. In order to get quality planting material (QPM) for 2020-21 plantation, 1,46,42,000 seedlings (48,50,000 seedlings of 18 months old + 97,92,000 seedlings of 6 months old) has been raised under Preliminary Operation.

To carry out the above activities, funds to the tune of Rs.30.00 Crore has been met out of provision made in the approved APO under Plantation activities and Interest fund (Pre-planting Operation for 2020-21 plantation Rs.20.00 Crore + Revision of wage rate Rs.10.00 Crore).

The committee approved the aforementioned activities post-facto.

Chief Secretary-cum-Chairman directed the officials to intensify field level management of the afforestation project under CAMPA. He also stressed on effective implementation of WL Management Plan and growth of bio-diversity. He further directed to enhance the mangrove forest covered in Bhitarkanika area of Kendrapara district. It was further decided to include correction of sagged electric line and other related interventions in the site specific WL Management Plan to minimize man-animal conflict. The Department was also advised to take up bald hill plantation in Koraput, Rayagada, Bolangir and Kalahandi districts.

Chief Secretary.

17th STEERING COMMITTEE MEETING OF STATE CAMPA, ODISHA
Held on 11.02.2020 at 12.45 P.M. under the Chairmanship of Chief Secretary, Odisha

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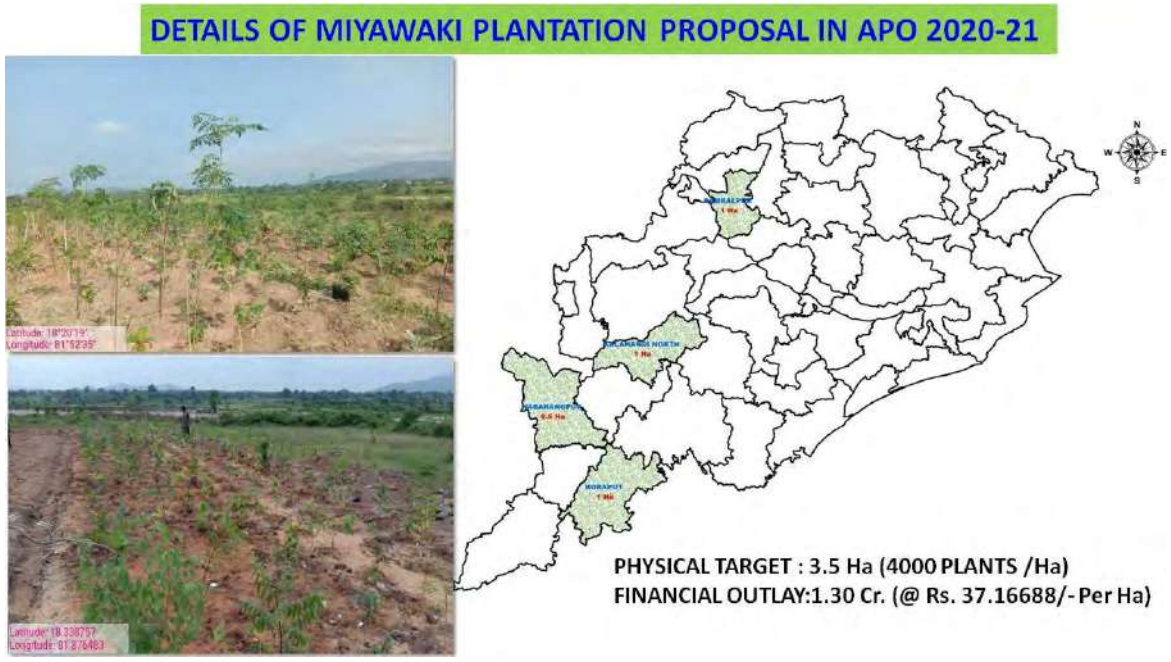
Participants

Sl.No.	Members Present	Signature
01	Development Commissioner cum Addl. Chief Secretary	
02	Addl. Chief Secretary to Govt. of Odisha Forest & Environment Department.	
03	Principal Chief Conservator of Forests, & HoFF Odisha,	
04	Principal CCF (Wildlife) & CWLW, Odisha	Addl. PCCF (WL)
05	Principal Secretary to Government, Rural Development Department	
06	Principal Secretary to Government, Agriculture & Farmers Empowerment Department	
07	Principal Secretary to Government, Revenue & Disaster Management Department	
08	Principal Secretary to Govt., Panchayati Raj & Drinking Water Department For	Manas Ranjan Dalabehera Addl. Secy. PR & DW Dept
09	Principal Secretary to Govt., Science & Technology Department	
10	Principal Secretary to Government, Finance Department	
11	The Commissioner-cum- Secretary to Govt. ST & SC Development Department	
12	PCCF cum Project Director OFSDP, Bhubaneswar (special invitee)	
13	Additional Principal Chief Conservator of Forests (Central), Eastern Regional Office, MOEF, Govt. of India	AIGF (C).
14	Principal Chief Conservator of Forests (Forest Diversion) & Nodal Officer, O/o the Principal CCF, Odisha	
15	Member Secretary, State Forest Development Agency, O/O PCCF, Odisha	
16	Director & Special Secretary, SC & ST Research & Training Institute, Bhubaneswar	
17	Chief Executive Officer, of the State Authority, as Member Secretary	

Table 2.1.2 DIVISION WISE & LOCATION WISE DETAILS OF MIYAWAKI PLANTATION						
Sl No	**Name of the Division**	**Location**	**Area in Ha.**	**Fin Target (Lakhs)**	**Geo Co-ordinates**	
1	Sambalpur	Potapali VF	1	37.17	N-21-26-55.56	E-83-55-31.07
2	Kalahandi (N)	Kutrukhai	1	37.17	N19 05 48.3	E83 08 27.8
3	Koraput	Sapara - B	1	37.17	N18.81842	E82.68044
4	Malkangiri	Balimela NAC	0.5	18.58	N 18.22727	E 82.08529
		Grand Total-	***3.5***	130.08		



Office of the General Manager(Subhadra Area)NEAR BIJU MAIDANPo/Dist: Angul – 759122 (Odisha)Website :www.mcl.gov.inmail Id: gmsubhadraarea@gmail.com gm-subhadra.mcl@coalindia.in

Ref. No. MCL/GM(SA)/2024/793

Date: 24 .09.2024

Undertaking Regarding Animal Passage Plan

Subhadra OCP do hereby undertake implementation of the measures mentioned below for the Animal Passage Plan in and around the Subhadra OCP mining lease area in the future.

1. Maintain no mining Zone along this Singhada Jhor Nallah (100m on both sides) total width of the proposed passage 250m (2x100m + 50 m) including the width of the Singhada Jhor Nallah within leasehold area of Subhadra Project

2. Maintain vegetation cover all along the Nallah.

3. Steps are to be taken to keep this nallah free from any garbage especially plastic bottles / Polythene.

4. Motivational drive among the villagers living near to this Nallah. Implement community awareness programs to educate local populations about the importance of wildlife conservation and ways to reduce human-animal conflicts.

5. Extensive SMC measures to be taken along the Nallah to ensure water availability round the year.

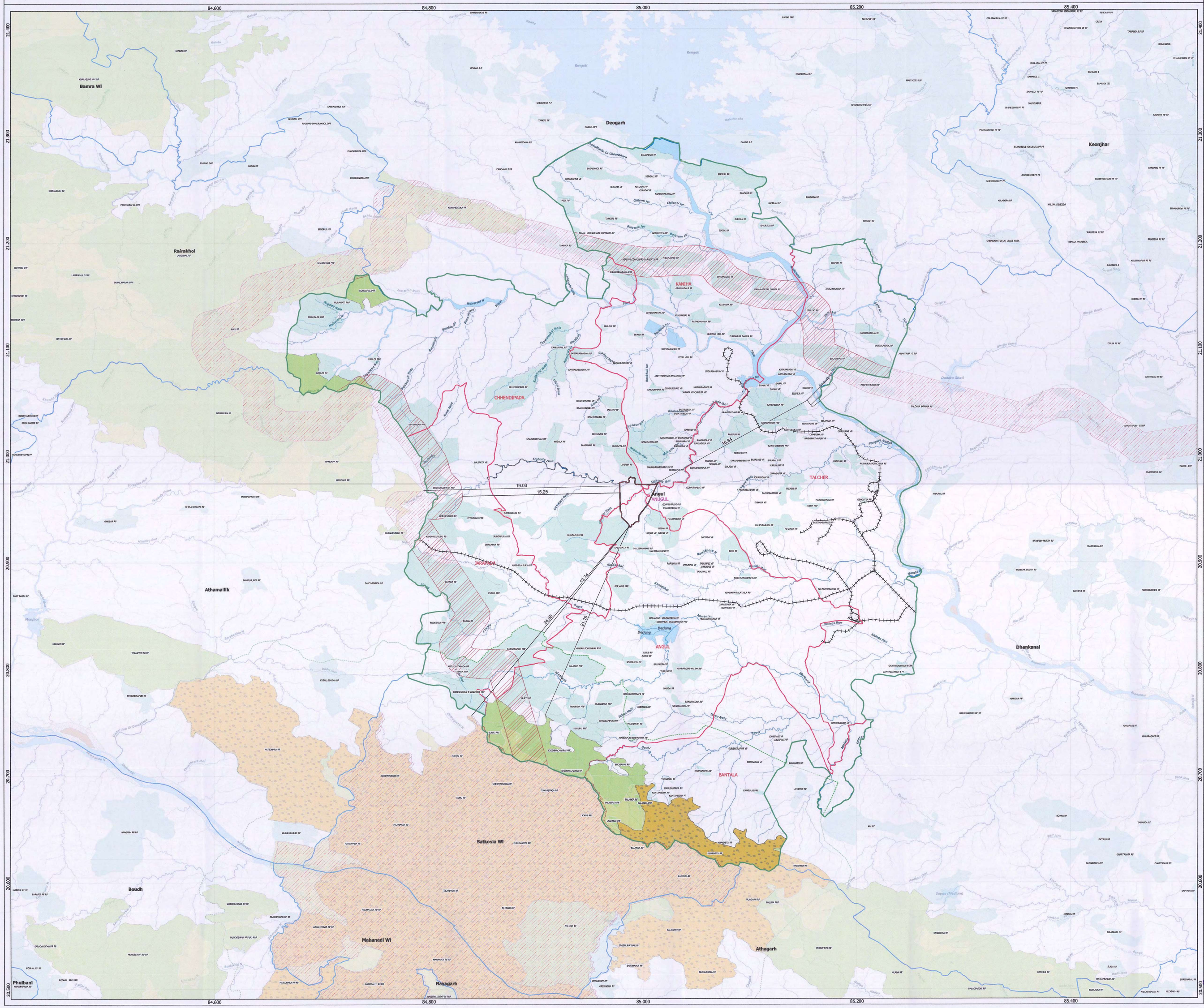
6. MCL will ensure that no pollutants and discharge from the mining activity will enter the Nallah.

24.09.24

महा प्रबंधक
सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area

General Manager
Subhadra Area, MCL
Authorized Signatory

Map showing the distance between the protected area and corridors from the Subhadra OCP Coal Block in the Angul Forest Division.



SCALE
1:100,000

0 10 20 km

LEGEND

- Kanehijena-Anantapur Corridor
- Division Boundary
- Tiger Corridor
- Satkosia TR Boundary
- Sambalpur Elephant Reserve
- ECO_SENSITIVE_ZONE
- Mahanadi Elephant Reserve
- Waterbody/River order
- Forest Block Boundary
- Range Boundary
- Railway Line
- ML Boundary of Subhadra OCP
- Distance between Protected Area

Name of Protected Area	Distance in Km
Proposed ECO SENSITIVE ZONE	13.74
Kanehijena-Anantapur Elephant Corridor	16.84
Mahanadi Elephant Reserve	21.19
Sambalpur Elephant Reserve	19.03
Satkosia Tiger Reserve Boundary	24.85
Satkosia-Similipal Tiger Corridor	15.25

Staff Officer(Envt.& Forest)
MCL Subhadra Area

Project Head
Subhadra Coal Mining Ltd., Angul

महा प्रबंधक
एमसीएल, सुभद्रा क्षेत्र
General Manager
MCL, Subhadra Area

Divisional Forest Officer
Angul, Division