CENTRAL COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)
(A Govt. of India Undertaking)
OFFICE OF THE PROJECT OFFICER
MAGADH OCP, MAGADH-SANGHMITRA AREA
E-mail ID. pomagadhms@gmail.com

CCL
(A Miniratna Category-I Company)

Ref. No.: PO(M)/Forest/192.23 Ha 2023-24/ 2809 Date: 01.12.2023

To

The Divisional Forest Officer
Chatra South Forest Division
Chatra

Sub: Compliance to the query raised by ED Nodal, GOJ vide letter no 1011 dated 07.10.2023
Ref No :- i. Letter F. No. 8-27/2022-FC; dated 28.04.2023
ii. Letter No 604 dated 02.11.2023 from CF, Chatra
iii. Letter No 2652 dated 03.11.2023 from DFO Chatra South

Respected Sir,

In reference to the above-mentioned letter the Approved Wildlife Management Plan in respect of the already diverted forest land of 96.72 Ha and current proposal of 192.36 Ha is enclosed as Annexure-I. This is also in compliance to the point no. 11 and 13 of MoEF&CC query dated 28.04.2023.

Further the revised compliance in respect to point no. 11 and 13 of MoEF&CC query dated 28.04.2023 is as under:

Sl No	Query	Compliance
11	As per the information received, the condition no. 18 of the Stage-II approval dated 18.10.2010 for diversion of 96.72 ha forest land has not been complied, which needs justification Moreover, a copy of Wild life Management Plan approved by the CWLW shall be submitted.	The condition 18 states that "The user agency to bear the cost of implementation of conservation plan to be prepared in consultation with the CWLW of the State for the Hazaribagh National Park and its buffer zone adjoining CCL mining zone." The delay in preparation of WLMP occurred due to confusion, as to who has to prepare the WLMP. User agency is committed to bear the related implementation cost of Wild Life Management Plan in compliance to point no 18 of Stage II condition. Subsequently, after due deliberations with the concerned forest officials, the combined Wild life Management plan for the already diverted forest land of 96.72 Ha and current proposal of 192.36 Ha has been prepared under the supervision of the forest department with a proposed budget of Rs. 7189.00 Lakhs for 10 years. Out of this, Rs 2352.66 Lakhs is for Hazaribagh National Park and Rs. 4836.34 Lakhs is for the management of wildlife in Chatra South Forest Division. The plan was submitted to PCCF CWLW after due recommendation from DFO Chatra South, DFO Wild Life Hazaribagh, CF Chatra, RCCF Hazaribagh and CCF Wildlife. Subsequently the Plan has been approved by PCCF CWLW vide letter no. 39 dated 29.11.2023. The approved wildlife management plan along with the approval is enclosed as **Annexure-I** and **Annexure-II** respectively. Further the undertaking to bear the cost of implementation of wildlife management plan is being enclosed as **Annexure-III**.

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Project Officer
Magadh OCP

13	The State Government shall furnish details of steps taken by the State Forest Department to rectify the lapses happened in the past regarding the implementation of WLMP of 96.72 ha proposal in the past.	The condition 18 states that "The user agency to bear the cost of implementation of conservation plan to be prepared in consultation with the CWLW of the State for the Hazaribagh National Park and its buffer zone adjoining CCL mining zone." The delay in preparation of WLMP occurred due to confusion, as to who has to prepare the WLMP. User agency is committed to bear the related implementation cost of Wild Life Management Plan in compliance to point no 18 of Stage II condition. Subsequently, after due deliberations with the concerned forest officials, the combined Wild life Management plan for the already diverted forest land of 96.72 Ha and current proposal of 192.36 Ha has been prepared under the supervision of the forest department with a proposed budget of Rs. 7189.00 Lakhs for 10 years. Out of this, Rs 2352.66 Lakhs is for Hazaribagh National Park and Rs. 4836.34 Lakhs is for the management of wildlife in Chatra South Forest Division. The plan was submitted to PCCF CWLW after due recommendation from DFO Chatra South, DFO Wild Life Hazaribagh, CF Chatra, RCCF Hazaribagh and CCF Wildlife. Subsequently the Plan has been approved by PCCF CWLW vide letter no. 39 dated 29.11.2023. The approved wildlife management plan along with the approval is enclosed as **Annexure-I** and **Annexure-II** respectively. Further the undertaking to bear the cost of implementation of wildlife management plan is being enclosed as **Annexure-III**. In view of the above facts it is apparent that necessary steps have been taken by the forest department and user agency for implementation of appropriate WLMP for the forest area (96.72 Ha) already diverted vide F. No.-8-38/2008/FC dated 18.10.2010

It is requested to kindly consider the compliance and forward the proposal for issuance of Stage-I Forest Clearance.

Yours Faithfully

01/12/23

Project Officer
Magadh OCP

SADALA SATYANARAYAN
Project Officer
Magadh OCP

ANNEXURE-I

SITE SPECEFIC WILD LIFE CONSERVATION PLAN

2023

Magadh Open Cast Project
Chatra , Jharkhand

SUBMITTED TO

DFO CHATRA SOUTH FOREST DIVISION AND
HAZARIBAG WILD LIFE FOREST DIVISION

6.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

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01.12.23
S. DALA SATYANARAYAN
Project Officer
Magadh CCP

Executive Summary- Magadh OCP Wildlife Management Plan

Background:

The CCL a Govt. of India undertaking company has been entrusted with the duty to *supply coal to steel plants, Thermal power plants, captive power plants, cement plants* and others. The demand in the power sector and in other sector is increasing constantly. So there is a need for opening of new mines.

Coal is the primary driving force for generating energy to meet the growing demand by the communities, companies and others. CCL is among the biggest players in the country for supply of coal to this very purpose. The Magadh OCP is located in the northern part of the NK coal field and lies in Chatra and Latehar district of Jharkhand. The coal block covers an area of 8.51 sq Km out of which 7.99 sq Km is coal bearing area. The project is situated in the Tandwa block of Chatra district. It falls under Tandwa range of Chatra South Forest Division. Though the project has area in the Latehar and Chatra district but all the forest area falls under Chatra district and Chatra South Forest Division.

Introduction:

The Magadh block is located between longitude 840° 57'40" and 840° 59' 30" E and latitude 230° 49' 15" and 230° 51' 30" N and Tandwa Block is situated between longitude 840° 55' 35" and 840° 57' 40" E and Latitudes 230° 47'40" and 230° 50' 38"N. The Dumargarh block located between longitude 840° 54'50" and 840° 56' 09" E and latitude 230° 48' 30" and 230° 50' 56" N .The Karimati block is located between longitude 840° 53'40" and 840° 54' 54" E and latitude 230° 48' 40" and 230° 49' 40" N.

The North Karanpura Coalfield forms a part of the east west trending valley between Hazaribagh plateau in the north and Ranchi plateau in the south. The Aswa Pahar in the south separates the North Karanpura Coalfield and the South Karanpura Coalfield by an east-west elongated metamorphic patch.

PO-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

DFO- Chatra South
सबा आलम अंसारी, (भा.व.से)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

CF-Chatra
Conservator of Forests
Territorial Circle, Chatra

RCCF-Hazaribag
Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life
वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

SADALA SATYANARAYAN
Project Officer
Magadh OCP

However, they are almost interconnected near Bachra and Hindgir village by a narrow tongue of Talchir outcrops. On the eastern side, the North Karanpura Coalfield is separated from the West Bokaro Coalfield by a narrow stretch of metamorphic rocks having several outliers of Talchir Formation. In the west, it is separated from the Auranga Coalfield by a stretch of about 20km wide metamorphic belt.

The Magadh OCP is approachable by 12 Km long fare weather Kutcha road from Tandwa village which is connected to Khalari via Piparwar by a 20 Km long fare weather road in the south and to Hazaribagh by a 50 Km long Metalled road via Barkagaon. Another metalled road connects Tandwa village with Hazaribagh (80 Km) via Semariea. A fair weather kutcha road connecting Tandwa village with Balumath also runs close to this OCP, which in turn is connected to Khalari via Tori and Bijupara. The nearest railway station is the Ray, which is at a distance of about 35 Km from the block, on BarkakanaDehri-on-Sone loop line of the Eastern Railway. Tori Railway station is another nearby railhead, located south-west of the block, at a distance of about 45 Km.

The Magadh OCP is characterised by more or less flat terrain with gentle undulations. In general, the ground slopes towards south in major part of the block. In the northern part, it slopes towards the east. The maximum elevation of 509m is noticed in the northern part of the block, where lower seams are incroping. The minimum elevation of 464m is noticed near the southern block boundary.The drainage of Magadb OCP is controlled by Pindar Kalkalnala,. flowing west to east in the northern side of the property. and Kuhubadnala flowing north to south along the Western block boundary. The Kuhubadnala meets the Garhi river in the south at a distance of about 10 Km. There is no parennial water body within the block. The average monthly rainfall during the monsoon period (June to October) is 200mm and during the non-monsoon period (Nov. to May) is 20mm

Climate is tropical. Average monthly rainfall during monsoon is approximately 1200 mm while in summer season the climate is hot. The maximum and minimum temperature ranges from 40 degree to 5 degree.

PO-Magadh OCP

DFO- Chatra South

सबा आलम अंसारी, (भा.व.से.)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

CF-Chatra

Conservator of Forests
Territorial Circle, Chatra

RCCF-Hazaribag

Regional Chief Conservator of Forests
Hazaribagh

NIRPENDRA NATH
Project Officer
Magadh Project

DFO-Hazaribag Wild Life

Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life

मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

SADALA SATYANARAYAN
Project Officer
Magadh OCP

State Government's letter No Van-Bhumi-103/2007/1255/VP dated 21.04.2008 on the subject mentioned above seeking prior approval of the Central Government under Section 2 of the Forest (Conservation) Act, 1980 and to say that the proposal has been examined by the Forest Advisory Committee constituted by the Central Government under Section-3 of the aforesaid Act. After careful examination of the proposal of the State Government and on the basis of the recommendations of the Forest Advisory Committee, In principle approval/Stage-I Clearance of the Central Government is hereby granted for diversion of 96.72 hectares of forest land for Magadh OCP in favour of M/s. Central Coal Fields Limited (CCL) in Chatra district (Earlier West Hazaribag district) of Jharkhand. **(Attached as annexure-1)**

Public Benefit of Mines:

- **Economic growth:** Mining is one of the key sectors driving Jharkhand's economic growth. Jharkhand's mines are growth engine for power generation and other industries driving India's production and manufacturing sector.

- **Generation of Jobs:** Mining creates a chain of job opportunities for people living in the area. It creates various opportunities for employment like road side hotels, vehicle repairing shops will come up, which will have potential to create self employment and also employ others.

Land required:

The total land requirement for Magadh OCP has been estimated as 654.49 ha of forest land. This has 3 different proposals as mentioned below-

Land Required in Ha			Divisions involved
Magadh	1st Mines	96.72	Chatra South
	2nd Mines	192.36	Chatra South
	3rd Mines	365.41	Latehar
Total Land		**654.49**	

PO-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

DFO- Chatra.South
सबा आलम अंसारी, (भा.व.से)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

CF-Chatra
Conservator of Forests
Territorial Circle, Chatra

RCCF-Hazaribag
Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life
मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Current plan is proposed for the 1st ad 2nd mines covering an area of 289.08 ha of forest land. Details of the land required for the two mines are mentioned in the table below-

All areas in Hectare							
Mines	Area	Non forest	GM-JJ	Forest	GM Khas	GM Aam	Non Forest
1st	96.72	19.20	77.52	**96.72**	0	0	0
2nd	192.46	57.29	135.07	**192.36**	11.59	5.30	202.99
Total	289.18	76.49	212.59	**289.08**	11.59	5.30	202.99

508.96

Compensatory afforestation of degraded forest land of 578.16 hectares will be done at the cost of user agency with minimum number of 578160 number of plants. The user agency has already transferred the cost of compensatory afforestation and its maintenance for 10 years to the State Forest Department.

The proposed project covers four villages namely Masialong, Kundi, Devalgada and Saradhu. The project impact villages in 10 Km radius are 52 in number. The total impact area is 5000 ha with land use having mono cropped Paddy and other areas including forest area. In the same area CCL has also got approval for implementation of the wild life management plan and soil conservation plan for a coal conveyor belt hence in this plan area other than already taken up villages has been given preference. Map of the impact area attached for reference.

As can be seen from the breakup of the area, forest area of Chatra South Forest Division falls under the area proposed for diversion for the said project. However, these areas have notably movements of the mega fauna like elephants and wild animals of nearby forest areas. Incidents of Human-Elephant conflict are regularly being reported in these areas due to these regular encounters. Also, regular anti-depredation measures are being undertaken by the forest department in these areas, to minimize the losses in such incidents. Therefore it would be very naïve to think that the areas which are outside notified forest area, any change in land use pattern or any project outside notified forest area will have no impact on the wildlife and their habitat.

PO-Magadh OCP

NIRPENDRA NATH
Project Officer
Magadh Project

DFO- Chatra South

सबा आलम अंसारी, (भा.व.से.)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

CF-Chatra

Conservator of Forests
Territorial Circle, Chatra

RCCF-Hazaribag

Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life

Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life

उप वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

Damage during wild life raiding in Tandwa Range over the last 7 Years

Year	Type of Damage	Incidents
2015	Crop damage	70
	House damage	33
2016	Animal damage	2
	Crop Damage	5
	House damage	2
2017	Animal damage	5
	Crop Damage	77
	House damage	24
	Human casualty	1
2018	Animal damage	2
	Crop Damage	63
	House damage	5
	Human casualty	1

Year	Type of Damage	Incidents
2019	Animal damage	2
	Crop Damage	6
	House damage	5
	Human casualty	1
2020	Animal damage	0
	Crop Damage	30
	House damage	5
2021	Animal damage	0
	Crop Damage	105
	House damage	13

Objective of the proposed Wildlife Mitigation Plan are:-

- Create awareness among communities on forest fringes for reducing human –animal conflicts
- Protection and Conservation of wildlife in the project area and also its impact area
- To take measures for improvement in the habitat area

PO-Magadh OCP
Project Officer
Magadh Project

DFO- Chatra South
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

CF-Chatra

RCCF-Hazaribag
Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wildlife
वन्य प्राणी, झारखण्ड, राँची

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

- To put up artificial nests for avian fauna
- To equip respective ranges to control and reduce forest fire incidences
- To reduce biotic pressure on forest for fuel wood by educating and through distribution of improved cook stoves

There is a great impact of geology on the distribution of forests in the region. The relative compositions of crop are found according to aspect, biotic factors and topography. Miscellaneous forests occur in all the zones. Some where it is confined to a small patch. In upper storey are *Anogeissus latifolia, Terminalia belerica, Terminalia chebula, Adina cordifolia, Butea monosperma, Diospyros melanoxylon, Cassia fistula, Lagerstromia parvifolia, Sterculia urens, Albizzia sps, Buchannia lanzan , Aegle marmelos etc. In the under storey are found Holehhrena antydysentrica, Croton oblongifolius, Nycatanthes arbostristis, Ziziphus sps.* The commonest climbers are Bauhinia vahlii.

Tree species present in the tract belong to several families. The prominent families are Dipterocarpaceae, Ebenaceae, Fabaceae, Anacardiaceae, Flacourtiaceae, Lytheraceae, Mimosaceae, Rubiaceae, Sapindaceae, Tiliaceae, Arecaceae, Bombacaceae, Combretaceae, Moraceae, Meliaceae and Euphorbiaceae.

Status of Flora and Fauna-

- Sal (Shorea robusta) is predominant species in the region, with its associates. Some areas have miscellaneous forests with species like Kend, Piar, Dauntha, Sidha, Mahua, Salai, Khair etc. All the forests fall in subgroup 5B, i.e. Northern Tropical Dry Deciduous Forests as classified by Champion and Seth.
- The hilly terrain of proposed area is suitable habitat to sustain wild animals like Elephant, Jackal, Wolf, Hyena, Mongoose, Nilgai, Porcupine, Jungle cat, Rock Python etc. such animals are very important for a healthy ecosystem. Besides these varieties of bird species raptors, wetland birds, local migrants, bush birds etc. are found in the region.

PO-Magadh OCP DFO- Chatra South CF-Chatra RCCF-Hazaribag

NRIPENDRA NATH
Project Officer
Magadh Project

सबा आलम अंसारी, (भा.व.से.)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life CCF-Wild LIfe

Divisional Forest Officer
Wildlife Division, Hazaribag

मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

SADALA SATYANARAYAN
Project Officer
Magadh OCP

- The important schedule I species Indian Elephant, Indian wolf, Indian Vulture, Peafowl and Python are seen in the project area and besides this, other animal listed in Schedule-II (Wild dogs), Schedule III (wild pigs, Sambhars) and IV (Hares, Hawks and Owls) of wildlife Protection Act, 1972.

- The wildlife is under continued threat due to developmental projects, global warming, vehicle movement, noise pollution, fragmentation of habitat and man- animal conflict. They require food, water, shelter for breeding and forest cover to sustain its life in wild.

- The purpose of this plan is to maintain wildlife habitat, restore degraded habitats, improve biodiversity, reduce man and wildlife conflict and organise village level institutions for the realization of the above objective as mitigation measures due to habitat loss by the project.

- While making this Wildlife Management Plan care has been taken to identify the needs of the wildlife. The basic need of food, water and shade (shelter), has been identified and budgetary provision for each item has been incorporated in plan.

- The research and continuous monitoring of impact is necessary for wildlife conservation. Hence provision for such activities has been made in plan.

The potential threat specific to wild life that has come out from the discussion with community and other stake holders are-

- Forest fragmentation and loss of habitat for birds and other animals living on trees.

- Due to edge effect some geo-hydrological disturbance may occur
- Clearing for land facilitates weed invasion.

PO-Magadh OCP
NIRPENDRA KUMAR
Project Officer
Magadh Project

DFO- Chatra South
सबा आलम अंसारी, (भा.व.से.)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

CF-Chatra

RCCF-Hazaribag
Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life
मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Habitat destruction: Coal Extraction requires clearing large tracts of land. This begins by clear-cutting and burning forests. Then, in order to reach underground coal seams, miners must remove huge amounts of soil and rock; destroying wildlife habitat. One particularly destructive form of surface mining, called mountaintop removal, literally involves blasting apart the top of a mountain and pushing the soil and rock into nearby valleys.

Air pollution: Sulfur dioxide, nitrogen oxides, particulate matter, mercury, carbon monoxide, and arsenic are just a few of the harmful pollutants emitted by coal plants. These pollutants cause a variety of respiratory and cardiovascular diseases that impact not only humans, but wildlife as well.

Coal ash spills: Coal ash is the toxic waste generated by coal-burning power plants. This toxic sludge can be stored in coal ash ponds that are too often improperly safeguarded against drainage lines and rivers. This negligence has resulted in numerous spills that have devastated natural wildlife habitat.

Water pollution: Coal mining impacts aquatic wildlife in several ways. As noted above, both top soil removal and coal ash spills can result in harmful pollutants entering waterways. One of the most noticeable effects of coal mining on water is acid mine drainage, or the outflow of acidic water from coal mines into nearby rivers and streams. Acid mine drainage disrupts the growth and reproduction of aquatic plants and animals and can result in the loss of aquatic life.

Coal dust: The dust created by the crushing and processing of coal causes a host of problems for wildlife. In addition to potentially severe heart and respiratory problems, coal dust can impair the ability of leaves to photosynthesize and oxidizing coal particles can settle in waterways, reducing the oxygen available for aquatic wildlife.

In short major potential impact on wild life are-

- Significant mortality of invertebrates and vertebrates animals particularly asamphibians, reptiles and soil fauna.
- Disturbance in the movement of animals in the area.
- Nesting and breeding grounds of various species will get disturbed.

PO-Magadh OCP

NIRPENDRA NATH
Project Officer
Magadh Project

DFO-Chatra (भा.व.से)
सबा आलम अंसारी
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

CF-Chatra
Conservator of Forests
Territorial Circle

RCCF-Hazaribag
Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life
मुख्य वन संरक्षक
प्राणी, झारखण्ड, राँची

SADALA SATYANARAYAN
Project Officer
Magadh OCP

- Shortage of food, cover and water base for wild fauna are expected to due to habitat fragmentation in the corridor area.
- Forest fire and Increase in man-animal conflict.

If the ground vegetation is not maintained it may cause fire. Such incidence will adversely affect the flora and fauna and microclimate of soil. Besides valuable soil moisture; nesting sites of birds & insects' habitats, several palatable species of grasses will be lost due to fire causing a lot of hardships to the existing wildlife.

Mitigation measures proposed:

The project has proposed certain mitigation measures which will help in mitigating negative impact of the project and these includes-

Component-1 – Increasing the local biodiversity in forest and non forest area

1. **Forest Restoration by method of Silviculture and gap filling plantation-** Widespread deforestation and declining condition of the Jharkhand's forests has resulted in environmentally, economically and aesthetically impoverished landscapes.

   To compensate the damage caused an area of 300 ha has been proposed for restoration with a cost of Rs.259.50 lakh over the 10 Yrs based on the requirement as prescribed in the working plan of the division.

2. **Afforestation on degraded land, hill, blank patches:** Deforestation and degradation of forests and protection forests belts contribute to land degradation in many regions of Jharkhand. Over the last decades, land affected by soil erosion increased by about 10000 ha annually.

   The plan proposes to work on the degraded land with a cost of Rs. 361.00 lakh in an area of 150 ha with afforestaion on these degraded lands and blanks created under the protected forests.

PO-Magadh OCP DFO- Chatra South CF-Chatra RCCF-Hazaribag

NIRPEN DRA NATH
Project Officer
Magadh Project

सबा आलम अंसारी, (भा.व.से)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life

Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life

मुख्य वन संरक्षक
प्राणी, झारखण्ड, राँची

SADALA SATYANARAYAN
Project Officer
Magadh OCP

3. **Bamboo plantations:** Bamboo is known as an ancient grass with woody timber. Bamboo has many uses, mainly in construction (flooring, roofing designing, and scaffolding), furniture, food, biofuel, fabrics, cloth, paper, pulp, charcoal, ornamental garden planting, and environmental characteristics, such as a large carbon sink and good phytoremediation option, improving soil structure and soil erosion.

   Bamboo plantation in 100 ha will be done at a cost of Rs.142.98 lakh.

4. **Salt licks:** Salt licks are deposit of mineral salts used by animals to supplement their nutrition, ensuring enough minerals in their diets. A wide assortment of animals, primarily herbivores use salt licks to get essential nutrients like calcium magnesium, sodium and zinc.

   Salt licks will be created at a cost of Rs. 00.80 lakh/Yr for 10 yrs making it a cumulative cost of Rs.8.00 lakh.

5. **Wildlife Habitat Improvement (Water Holes):** The influence of wildlife management with the goal of maintaining wildlife population and the entire biodiversity at maximum level and maximum ecosystem utilization depend heavily on the knowledge of mineral elements in the nutrients requirement of animals. Salt licks are deposit of mineral salts used by animals to supplement their nutrition, ensuring enough minerals in their diets.

   Water holes will be created at a cost of Rs.0.40 lakhs/yr and a cumulative cost of Rs.4.00 lakh.

6. **Provision for water tanker for wildlife and forestry with lifting pump, driver, POL and maintenance:** Despite of all efforts from the department and taking all measures to ensure water availability for the animals sometimes due to deficient rain fall and higher temperature, water becomes scarce and hence provision for water tanker has been made under plan.

   It will be done at a cost of Rs. 59.00 lakhs for 10 Yrs.

PO-Magadh OCP DFO- Chatra South (भा.व.से) CF-Chatra RCCF-Hazaribag

NIRPENDRA NATH
Project Officer
Magadh Project

सबा आलम अंसारी
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

Conservator of Forests
Territorial Circle, Chatra

Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life

Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life

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राँची, झारखण्ड, राँची

SADALA SATYANARAYANA
Project Officer
Magadh OCP

7. **Conservation Measures for bird species: conservation measure for SCS (species of conservation significance) (woodland, grassland, water and migratory bird):** Many bird species migrate in order to survive. However, migration is a perilous journey and involves a wide range of threats. Only a small number of birds are actually threatened by natural events. Sad but true, human activities are the source for most dangers migrating birds are exposed to. And as diverse as people and their habits in different countries are, so are threats the birds face.

   Provision of Rs. 100.00 lakh has been done for this activity.

1. **Contour Cutting + Soil water Conservation @100 man-days per hectare for a total area of 600 ha(@Rs 350 * 100 workers * 600 ha):** The forest area in the command of the mines has been degraded due to various reasons and natural regeneration has been affected due to less water availability and drier soils probably. Making contour trenches will help in arresting the runoff and increasing the soil moisture regime. It will also reduce erosion as it will reduce velocity of the runoff water.

   Provision of Rs. 210.00 lakh has been done for this activity.

2. **Checkdam Pakka 15 in numbers each costing 15 lakhs:** A check dam is constructed across drainage ditch, or waterway to counteract erosion by reducing water flow velocity. In contrast to big dams, check dams are implemented faster, are cost effective, and are smaller in scope.

   Provision of Rs. 225.00 lakh has been done for this activity.

3. **Loose boulder check dam in Nallas:** Loose Boulder Structures (LBS) are one of the most important drainage line treatments. As the name suggests, LBS is made up of loosely arranged boulders so as to arrest excess erosion and water loss during the rainy season.

   Provision of Rs. 75.00 lakh has been done for this activity.

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NIRMAL CHANDRA NATH
Project Officer
Magadh Project

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वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

Conservator of Forests
Territorial Circle, Chatra

Regional Chief Conservator of Forests
Hazaribag

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

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Project Officer
Magadh OCP

4. **Creation of Ponds 15 in Numbers @6 Lakhs:** Ponds are the hidden gems all kinds of people love to come across. Its ecological benefits may go unnoticed because it is such a small body of water.

   Provision of Rs. 90.00 lakh has been done for this activity.

1. **Earthen Check dam 15 in numbers @6 Lakhs:** An earthen check dam is a loose stone and earth structure that serves to retain surface and sub-soil flows of water on gently-sloping land. Earthen check dams also function to prevent soil erosion.

   Provision of Rs. 90.00 lakh has been done for this activity.

5. **Maintenance and repair of pakka and Earthen Checkdam, LBCD and ponds mentioned above in Sl. No. A.9, A.10, A.11, A.12:** Structures that will be created under the project, will require maintenance and repair over time due to siltation and damage caused due to various factors. For maintaining these structures provisions has been made under the plan so that these structures remain sustainable and in use by communities and wild animals as well, when constructed close to forest.

   Provision of Rs. 125.00 lakh has been done for this activity.

6. **Linear Plantation along Rivers, canals, Roads total plants 20000:** As the state continues to grow so is the total length of roads. New roads are being constructed by the central and state government to give pace to the development interventions in the state. To make roads stabilize and reduce erosion, plantation will be done along the roads.

   Provision of Rs. 170.00 lakh has been done for this activity.

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NIRPENDRA NATH
Project Officer
Magadh Project

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वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

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Forest Circle, Chatra

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Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

2. Measures for Forest Protection, Anti-depredation and wildlife protection

1. **Deployment of 10 Home Guards @ 20000 per months:** Keeping people to guard different places like check nakas, forest exit points and also to keep vigil on the animal movements forest guards will be deployed on these places.

   Provision of Rs. 240.00 lakh has been done for this activity.

2. **Logistic and deployment cost of Home Guards:** To make the deployment effective logistics like dresses, sticks and torches and other instruments will be needed so that they can perform their duties with responsibility and accountability. The cost for the same will be borne by the project.

   Provision of Rs. 72.00 lakh has been done for this activity.

3. **Cost of mobile set and recharges:** To keep connectivity in place among the people deployed project will provide mobiles with facilities for recharge to be borne by the project.

   Provision of Rs. 4.50 lakh has been done for this activity.

3. Capacity building and procurement of anti- depredation items

1. **Provision for Crackers and other items:** Crackers and marshals have been in use by the department and communities to drive away the wild animal once they come close to villages. It keeps the casualties at minimum and helps communities to counter elephant raiding and attack by other animals.

   Provision of Rs. 20.00 lakh has been done for this activity.

2. **Snakes Catching Equipments:** Despite the fact that most of the snakes found in the forest are non poisonous people die due to snake bite from the fear. It will be important to distribute snake catching equipments to the persons having skill to catch snakes. Training to catch snakes will also be important

   Provision of Rs. 1.25 lakh has been done for this activity.

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NIRPENDRA NATH
Project Officer
Magadh Project

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Divisional Forest Officer
Wildlife Division, Hazaribag

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

3. **Training to trackers/watchers:** Wild animals generally come out of their safe zone during wee hours to nearby water bodies and fringes of villages in search of food. This makes them susceptible to have confrontation with humans and result in subsequent man-animal conflict.

   Provision of Rs. 15.00 lakh has been done for this activity.

4. **Rewards for information:** Wildlife tourism creates both positive and negative impacts. Economic benefit is the most important of these (Adhikari et al., 2005). Bio-physical impacts are more serious than others such as socio-economic. There will be provision to reward the informer who provide inputs about poaching, hunting, animal trafficking, tree cutting and other wildlife crimes.

   Provision of Rs. 20.00 lakh has been done for this activity.

5. **Animal Rescue and treatments:** Animal welfare describes how an animal is coping mentally and physically with the conditions in which it lives. This includes activities relating to population control, habitat management, humane handling, and when necessary, humane killing.

   Provision of Rs. 40.00 lakh has been done for this activity.

6. **Payment towards cost of establishing wild animal rescue team:** Despite of huge technical advantage and many sophisticated gadgets which help in tracking the wild animals, the rescue of the wild animals are mostly done through the human efforts.

   Provision of Rs. 127.20 lakh has been done for this activity.

7. **Construction of machans along Paddy fields:** Elephant raiding is common during the paddy seasons and construction of machans will help in locating animals fast and taking precautionary measures for protection of crops and human life as well. This will also help in thrashing paddy after harvesting.

   Provision of Rs. 3.20 lakh has been done for this activity.

PO-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

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चतरा दक्षिणी वन प्रमंडल

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Divisional Forest Officer
Wildlife Division, Hazaribag

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

4. Fire Prevention and Protection of Habitat

1. **Fire line creation for 50 km @ Rs. 30500 per km * 50 km:** This one is taking place in forests, where the latest fire seasons have been raging with unprecedented ferocity– which was already a record year for fires.

   Provision of Rs. 15.25 lakh has been done for this activity.

2. **Maintenance cost of fire line having 20 mans day per km every year @Rs. 350.00 per day *20 person* 50 km*10 years:** Firebreaks in a strict sense are linear discontinuities where the vegetation is absent or reduced to a low herbaceous layer. These breaks must be located at forest / urban interfaces or on ridges for a better effectiveness.

   Provision of Rs. 35.00 lakh has been done for this activity.

3. **Construction of 2 watch tower cum temporary shelter with solar and water facilities @12.00 Lakhs:** In Jharkhand, there are forest areas that are sensitive to fire in the first degree. As a result of forest fires, which is one of the biggest environmental disasters on forest resources, hectares of forest area is damaged annually. One of the important elements of combating forest fires is early detection.

   Provision of Rs. 24.00 lakh has been done for this activity.

4. **2 watchers at each tower ie total 2 watchers:** To man the watch towers two watchers will be posted at each of the towers and will keep a vigil on the activities under the view of the area.

   Provision of Rs. 50.40 lakh has been done for this activity.

5. **Forest fire:** Fire is the most potential threat to the flora and fauna of the area. Incidences of fire mayhappen due to various reasons and it cost very heavy for the forest and wild life residing in the forest. To protect forest from fires following measures has been proposed –

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चतरा दक्षिणी वन प्रमंडल

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Wildlife Division, Hazaribag

CCF-Wild Life
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वन्य प्राणी, झारखण्ड,

SADALA SATYANARAYAN
Project Officer
Magadh OCP

- **Forest Fire Management Squad:** It requires to be placed an equipped team for controlling and reducing forest fire incidences. Fire tracer will be hired for a period of 5 months from February to June every year by the department as these are the months when forests are more prone to forest fire.

  Provision of Rs. 52.50 lakh has been done for this activity.

6. **Forest Fire Fighting Equipment**: In order to equip the fire fighting squad itis proposed to provide the following equipments like Fire Blower, bush cutter and fire fighting suit etc

6.1.1. Cost of fire fighting suit @ Rs 7000 per person (considering life 5 years)
6.1.2. Cost of rented vehicles @50000 per months * 6 months
6.1.3. Purchase of fire blower @ Rs. 60000*10 blowers = Rs. 6.00 Lakhs
6.1.4. Running and maintenance of fire blower and cutting @ Rs. 30000 per blower per year * 10 blower
6.1.5. Purchase of brush cutter @Rs. 30000 * 10

Provision of Rs. 74.40 lakh has been done for this activity.

7. **Cost of mobile set:** To keep people in touch with each other, who are posted at different locations for different purposes for implementation of the wild life management plan, it is important to equip them with the mobile handset with facility for recharge. Provision has been made for the same.

Provision of Rs. 4.00 lakh has been done for this activity.

5. Livelihood improvement and capacity building to local people

1. **Farming of Medicinal Plants, Duckery, fishery, honey bee keeping, mushroom cultivation etc. @ 9 Lakhs for 5 years:** Jharkhand forests are rich in bio diversity with lots of herbs with medicinal value. Some of them can be cultivated and grown commercially for betterment of communities and traditional practitioners as well. Along with it additional nonfarm based livelihood options like duckery, fishery and others will be promoted with proper training and market linkage.

Provision of Rs. 45.00 lakh has been done for this activity.

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NIRPENDRA NATH
Project Officer
Magadh Project

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चतरा दक्षिणी वन प्रमंडल

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Territorial Circle, Chatra

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Hazaribagh

DFO-Hazaribag Wild Life

Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life

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Project Officer
Magadh OCP

2. **Distribution of Sal plates making machine and other equipments:** Traditionally women stitch raw sal leaf plates which are less remunerative and take lot of time. This has lesser demand in the market and puts a lot of drudgery on women. To make it more efficient and remunerative sal leaf plate making machines will be installed with the women SHG for creating NTFP based livelihood systems.

   Provision of Rs. 36.00 lakh has been done for this activity.

3. **Bamboo craft making:** Bamboo is a versatile input and is used as building material, paper pulp resource, scaffolding, agriculture implements, weaving material, plywood and particle board manufacture, basketry, furniture, pickled or stewed bamboo shoots, medicines, etc. Resource management and technical improvements can convert this fast-growing grass into a durable raw material for construction purposes and a wide range of semi-industrialized products.

   Provision of Rs. 9.00 lakh has been done for this activity.

Capacity building to local people in fringe villages

1. **Solar street light @ Rs. 20000 per solar light for 500 lights:** Ease in walking during evening hours and rainy days About 96% of the respondents mentioned that they find it easy to walk during evening and night hours in the village street. The ease in walking during evening and night hours is due to better illumination.

   Provision of Rs. 50.00 lakh has been done for this activity.

2. **Providing Grain bins @ Rs. 2000*150 bins:** Providing grain bins will help in preserving food items during elephant raiding. These bins can be of metals or of concrete. These can be very helpful in elephant affected areas.

   Provision of Rs. 3.00 lakh has been done for this activity.

PO-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

DFO- Chatra South
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Project Officer
Magadh OCP

3. **Long range rechargable tourch lights @ Rs. 2000*150 torch:** Strong lights keep the wild animal away from human habitations. Long range rechargeable torch lights can help as a cost effective means for keeping the animals away.

Provision of Rs. 3.00 lakh has been done for this activity.

4. **Training and capacity building of JFMC @ Rs. 20.00 Lakhs:** JFMC are vital link between communities and the department. They are crucial for flow of information from villages to the department. Their capacity should be built for taking various precautionary measures and taking initiatives for protection, preservation and propagation of forests.

Provision of Rs. 20.00 lakh has been done for this activity.

5. **Seed money for implementation of micro plan for JFMC @ Rs. 2.00 Lakhs per JFMC for 20 JFMC with focus of flora of medicinal and other ecological importance:** Capacity building lone will not serve the purpose and committees should have some financial resource available with them for taking initiatives. Seed money will help the committees to meet urgent expenses and it can be later on again refund back to the seed fund for keeping it intact and in fact growing.

Provision of Rs. 40.00 lakh has been done for this activity.

6. **Construction of shelter house/barrack:** Deep inside the forest sometimes front line workers need rest during peak of the summer and rainy seasons. There has to be some kind of shelter for the forest staff and trackers in the forest. Provision has been made for construction of the shelter house.

Provision of Rs. 35.00 lakh has been done for this activity.

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NIRPENDRA NATH
Project Officer
Magadh Project

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चतरा दक्षिणी वन प्रमंडल

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Territorial Circle, Chatra

Regional Chief Conservator of Forests
Hazaribagh

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Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

7. **Water Conservation/drinking water sources with purpose to local villagers:** For villagers the project will construct water sources for drinking. It will also serve the purpose of meeting the water requirement for animals. Thus it will make a good and safe source of drinking water for human and animals in need.

Provision of Rs. 50.00 lakh has been done for this activity.

Capacity building of forest department for implementing ,monitoring and supervision of plan

1. **Cost of Digital cameras and drone:** For implementation and monitoring digital camera and drone will be needed. Drones help in keeping track and also take a photo for the threats caused to animals due to habitation and loss of habitations due to clearance.

   Provision of Rs. 5.00 lakh has been done for this activity.

2. **Cost of night vision binocular, GPS:** Night vision binoculars and GPS will be necessary for tracking animals during night. It will help to warn villagers during night and also help to find the injured animals.

   Provision of Rs. 4.00 lakh has been done for this activity.

3. **Provision for 6 motorcycle @ Rs. 1.5 lakhs per motorcycle:** For fast easy and cost effective movement of the front line workers from forest motorcycles are best. These machines can move on narrow paths and can have access to remote locations. Inured human can also be taken to first aid facilities very fast. For keep these machines run properly a maintenance fund of motorcycles @ Rs. 12000 per year per motorcycle has been proposed. 30 liters of petrol will also be part of the maintenance

   Provision of Rs. 9.00 lakh for motorcycle and Rs. 21.60 lakh for petrol has been done for this activity.

PO-Magadh OCP

NIRPENDRA NATH
Project Officer
Magadh Project

DFO- Chatra South
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चतरा दक्षिणी वन प्रमंडल

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

4. **Vehicles for monitoring on rent (with driver, diesel and fuel)for CF and other higher officials:** Two vehicles will be hired for monitoring by the officers apart from the DFO of the division. These vehicles will also have provision for drivers and fuels along with maintenance.

   Provision of Rs. 84.00 lakh has been done for this activity.

5. **Vehicles for implementation on rent (with driver, diesel and fuel) for RFO:** At the range office a vehicle will be hired for the movement of the RFO and it will also have provision for diesel and driver along with maintenance.

   Provision of Rs. 72.00 lakh has been done for this activity.

6. **4 unskilled JFMC members DFO/RFO for patrolling to augment work force @Rs. 10500 per months:** Sometimes due to lack of adequate number of staff with no specific skills needed department suffers a lot and find it hard to respond to calls by villagers during emergency. Hence provision of four unskilled manpower has been made under the plan.

   Provision of Rs. 50.40 lakh has been done for this activity.

7. **One multitasking technical staff to support DFO for implementation and monitoring of wildlife Plan @40000 per month:** For implementation of the programme and to support the office of the DFO a mutiskilled person will be needed who can handle the day to day task and support the DFO in executing the devised wild life management plan and keep him updated of any development.

   Provision of Rs. 48.00 lakh has been done for this activity.

8. **Check Naka buildings:** To keep the check on illegal and unauthorized transportation of materials and goods from the forest, check nakas will be established along with the basic minimum facilities and safety measures for the forest people and the members of the JFMPCs. The home guard can also be posted for the purpose of checking the illegal trade.

   Provision of Rs. 20.00 lakh has been done for this activity.

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NIRPENDRA NATH
Project Officer
Magadh Project

DFO-Chatra South

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Wildlife Division, Hazaribag

CCF-Wild Life

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

9. **Solar power:** Renewables has been getting attention of late due to various sreasons like decrease in cost, less maintenance, greater acceptability and low recurring costs. It is also a safe source of energy from all perspective.

Provision of Rs. 2.50 lakh has been done for this activity.

10. **CCTV camera for Surveillance:** Installing a CCTV system will help department in instantly deterring criminals and theft. Most intruders look for easy targets where there are no security measures in place. Seeing the familiar look of a CCTV system installed at various sites will discourage them to act as the criminals and intruders will not want to be caught on camera.

Provision of Rs. 2.50 lakh has been done for this activity.

11. **Automated road crossing:** Automated road crossings prevent the pedestrian from an accident during heavy traffic areas. By implementing this smart setup, department will be able to find out the defaulters easily. This is more compatible and economical when setting up on a large scale. The pedestrian collisions occur due to the unethical behavior of the drivers skipping the signals can be avoided with the presented barrier model.

Provision of Rs. 2.00 lakh has been done for this activity. This will also have an annual maintenance cost of Rs. 1.00 lakh per year.

1. **Check naka duty staff in 3 members. 8hr duties for each@ Rs. 10500/months:** At the check naka 3 guards will be placed from the respective JFMPCs and will be paid honorarium per month. Provision for honorarium has been done for 10 yrs of the project period. These will be based on the daily wages prevailing at the time of joining.

Cycle, uniform and cost of deployment of to watchers will be provided while they are posted at the Check naka.

Provision of Rs. 47.80 lakh has been done for this activity.

PO-Magadh OCP

NITENDRA NATH
Project Officer
Magadh Project

DFO-Chatra

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चतरा दक्षिणी वन प्रमंडल

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

GIS and remote sensing for implementation and Monitoring

1. **RS & GIS software and accessories:** A high configuration gaming laptop or desktop with RS and GIS software will be procured for supporting the monitoring team and for documentation of the work done under the proposed wild life management plan.

   Provision of Rs. 25.00 lakh has been done for this activity.

2. **Remuneration to GIS expert @Rs.35000 per month * 12 months:** Working on GIS software is a highly specialized job and requires a person with skill set of operating the software and also getting interpretation out of the data gathered from the software.

   Provision of Rs. 42.00 lakh has been done for this activity.

3. **One computer operator @Rs. 20000/month * 12 months * 10 years:** Further one computer operator will be needed for supporting the office of the DFO. He will be responsible for keeping the soft copy of the documents related to the project.

   Provision of Rs. 24.00 lakh has been done for this activity.

4. **Setting up wildlife Monitoring center at CF office- Chatra:** The proposed mitigation plan will be monitored by the CF and RCCF. The CF office will be supported with a monitoring center for the proposed wild life implementation plan.

   Provision of Rs. 10.00 lakh has been done for this activity.

5. **Monitoring cell at DFO office:** With all facilities at the DFO office it will be responsible for monitoring of the implementation of the mitigation plan. The measures mentioned above will be part of the whole set up for monitoring at DFO's office. Provision of Rs. 20.00 lakh has been done for this activity.

NIRPENDRA NATH
PO-Magadh OCP
Magadh Project

DFO- Chatra South
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Divisional Forest Officer
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SADALA SATYANARAYAN
Project Officer
Magadh OCP

Awareness promotion about Medicinal Plants and protection of endengered species

1. **Short Film Preparation @2.00 Lakhs * 4 years:** The plan has made a provision of 8 lakh rupees for shooting documentary film for the works done under the mitigation plan. Each year carried out activities will be documented and filmed to create a documentary on the overall programme.

   Provision of Rs. 8.00 lakh has been done for this activity.

2. **Pamphlet Distribution and Nukkar Natak etc in local language for awareness @2.00 lakh per year:** The folk culture and nukkad nataks have always been part of creating awareness among the communities. The literarute in local language is also a powerful tool for communication. For the two measures the plan has made provisions and will be done at the village level.

   Provision of Rs. 20.00 lakh has been done for this activity.

3. **Celebration of world environment Day, wildlife week etc:** Celebrating important days across the year will keep communities involved and will help in creating awareness at all levels. Secondly doing it in the schools and other public places will help in creating a ripple effect of the programme.

   Provision of Rs. 30.00 lakh has been done for this activity.

4. **Wall Painting, Sologan, Poster etc:** Wall paintings and slogans are a tool to create awareness. It also helps in making villages look better through nice local paintings.

   Provision of Rs. 15.00 lakh has been done for this activity.

PO-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

DFO- Chatra South (भा.व.से)
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वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

CF-Chatra
Conservator of Forests
Territorial Circle, Chatra

RCCF-Hazaribag
Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life
मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Nature Interpretation Centre

1. **Construction of Nature Interpretation Center:** To create interest and scientific temperament among public especially students, it is proposed to build and maintain a nature interpretation centre. The location is to be decided by the DFO Chatra South at the time of implementation. A sum of **Rs 125.00 lakhs** is provided for construction of the interpretation center on wildlife / nature conservation & Environment.

   Provision of Rs. 100.00 lakh has been done for this activity.

2. **Equipping Nature Interpretation Centre:** To display and showcase the importance of Wildlife a mini library, audio Visual Display System (Multimedia System with LED TV) will be equipped inside the Interpretation Centre to run Wildlife and Nature Related Documentaries. An expenditure of **Rs. 40.00 lakhs** will be made for equipping the center.

3. **Live Edge Fencing with Entrance Gate**: To secure the complex an expenditure of **Rs. 20.00 lakhs** will be incurred towards providing live hedge fencing with entrance gate.

4. **Aesthetic Plantation/ Medicinal Garden:** To improve the aesthetics of the centre and to attract youth landscaping plantation will be done at a cost of **Rs. 10.00 lakhs.**

5. **Manpower:** 2 unskilled persons is to be recruited to maintain the interpretation center. The remuneration of unskilled person will be @Rs. 12912.95 per month. Total cost of remuneration is **Rs. 31.00 lakhs** to be provided by user agency on demand note raised by DFO- Chatra South.

6. **Running Expenditure:** To pay the electricity bills etc., a provision of **Rs.30.00 Lakhs** at the rate of Rs.3.00 Lakh per annum is made.

PO-Magadh OCP DFO- Chatra South CF-Chatra RCCF-Hazaribag

NIRPENDRA NATH
Project Officer
Magadh District

सबा आलम अंसारी, (भा.व.से.)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

Conservator of Forests
Territorial Circle, Chatra

Regional Chief Conservator of Forests
Hazaribagh

DFO-Hazaribag Wild Life

Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life

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01.12.23

SADALA SATYANARAYAN
Project Officer
Magadh OCP

7. **Providing Solar Panel Set:** A DG Set will be provided at the Centre as a backup power at the cost of **Rs. 15.00 lakhs**.

Corpus Fund

1. **Corpus Fund for ex Gratia Payment (Lumpsum Rs. 10 lakhs) to be *topped up on advice by CWLW* amount to be disbursed based on demand note from DFO Chatra South**
2. **Contingency amount**

Provision of Rs. 100.00 lakh has been done for this activity.

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NIRPENDRA NATH
Project Officer
Magadh Project

सबा आरेवा (भा.व.से)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

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Wildlife Division, Hazaribag

CCF-Wild Life
मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Intervention to be done by the DFO-Hazaribag Wild Life Division

Hazaribag and its adjoining areas have been known for the scenic beauty of forest and its resources. Development has resulted in competing land uses and often forest land is needed for carrying these developmental activities. Mining is one of them. It is needed for development to take place but it has fall out on wild lives. To compensate and maintain the floral and faunal biodiversity wild life mitigation plan has been proposed which will be implemented by the Division under the guidance of the DFO.

Component-1 –Awareness generation and capacity building: The activities of awareness generation and capacity building will be jointly taken by the user agency and department. Materials for the capacity building will be supplied by user agency whereas the programme will be designed and conducted by the department.

- **Wildlife signages installation in affected villages and approach:** Wildlife warning signs are the most commonly used and widespread form of mining impact mitigation, aimed at reducing the incidence of wildlife-vehicle collisions. Effectiveness of signs often indicates minimal change in driver behavior. However it makes drivers aware of the different animals in the area.

  Provision of Rs.12.00 lakh has been made for the proposed activity.

- **Training and awareness to EDCs, in schools, Village Level volunteers for wildlife conservation & protection with man - wild animal conflict management:** Human-wildlife conflict refers to negative interactions between people and wild animals that have consequences for humans, wildlife, or both. This usually occurs when the needs or behaviors of wildlife intersects with the needs or behaviors of people (or the other way around), resulting in adverse ramifications such as damaged crops, loss of livestock, or even loss of human lives. Less obvious impacts of conflict include the transmission of a disease if an animal bites a human, collision between animals and vehicles, targeted hunting, and fear-based attacks.

  Provision of Rs.20.00 lakh has been made for the proposed activity.

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- **Training to Forest force for using tranquilizing gun with doses for different wild animals with resource person:** Man animal conflict has been on the rise due to the diversion of forest land and competing land use for various purposes.

  The plan has made a provision of Rs.10.00 lakh for the said activities.

- **Provision of feeding trough for cattle in villages:** Since the villagers keep large herds and with tradition of open grazing. This creates conflicts between the villagers and the department. to reduce this conflict provision has been made for distribution of feeding trough.

  The plan has made a provision of Rs.20.00 lakh for the said activities.

- **Solarised Livelihood Station:** 2 Solarised livelihood station has been proposed for facilitating value addition at the village level without having dependency on fossil fuel or grid electricity.

  The plan has made a provision of Rs.25.00 lakh for the said activities.

Component 02: Forest Fire Management

Fire is the most potential threat to the flora and fauna of the area. Incidences of fire may happen due to various reasons and it cost very heavy for the forest and wild life residing in the forest. To protect forest from fires following measures has been proposed –

- **Forest Fire Management Squad:** It requires to be placed an equipped team for controlling and reducing forest fire incidences. Fire tracer will be hired for a period of 5 months from February to June every year by the department as these are the months when forests are more prone to forest fire.

  Provision of Rs.52.50 lakh has been done for this activity.

- **Forest Fire Fighting Equipment**: In order to equip the fire fighting squad it is proposed to provide the following equipments like Fire Blower, bush cutter and fire fighting suit etc.

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NIRPESH SINGH, Project Officer, Magadh Project

Divisional Forest Officer

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SADALA SATYANARAYAN, Project Officer, Magadh OCP

Provision of Rs.23.00 lakh has been done for this activity.

- **Fire fighting vehicle:** Forest fire occurs despite of the efforts by the department and its front line workers along with community. A fire fighting vehicle will help in dodging forest fire at the fast pace and will also help in meeting water requirement by the animals.

  Provision for a fire fighting vehicle with driver and cost of fuel has been made under the plan. A total cost of Rs.80.00 lakh has been made for the proposed activities.

Component 03: Habitat and water Management

- **Habitat improvement through plantations with fruit bearing trees:** An edible landscape is special in that it is planted with trees and shrubs that produce foods that we can eat/sell or that are beneficial for wildlife. Trees and shrubs can be used to provide shade, to improve microenvironments or to protect crops, or to mitigate challenging environmental issues.

  Provision of Rs.217.50 lakh has been done for this activity.

- **Bamboo plantations:** Soil Organic Carbon is one of the most important components that delineate the productivity of a terrestrial ecosystem. Bamboo being a good plant for wild animals especially that of elephant planting bamboos will improve the availability of fodder for the animals and there will be reduction in raiding in the villages.

  Provision of Rs.144.00 lakh has been done for this activity.

- **Silvicultural operations:** Among the different schemes that the forest department works in the state one important scheme is the silvicultural operations through which revival of degraded forests are done. By doing it health of the forest is improved by regeneration of the stumps and other small subdued growing plants.

  Provision of Rs.150.00 lakh has been done for this activity.

PO Magadh OCP — DFO Divisional Forest Officer Wildlife Division, Hazaribag — CCE-Wild LIfe

NIRENDRA NATH
Project Officer
Magadh Project

Wild Life

मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

01.12.23

SADALA SATYANARAYAN
Project Officer
Magadh OCP

- **Removal of lantata from the forest:** Weed infestation has been one of the crucial challenges of the department especially that of lantana as this causes severe damage to the local bio diversity.

  Provision of Rs.30.00 lakh has been made for this activity.

- **Check dams:** A check dam is constructed across drainage ditch, or waterway to counteract erosion by reducing water flow velocity. In contrast to big dams, check dams are implemented faster, are cost effective, and are smaller in scope. These help in conserving water, improving ground water and also it supports wild life during the summer.

  Provision of Rs.64.00 lakh has been done for this activity.

- **Desiltation of check dam:** Earlier built check dams have been filled with silt coming from the erosion of the catchment area and their impounding area have been decreased to minimum some places even zero. It requires to desilt these structures for improving availability of water and habitat improvement also.

  Provision of Rs.60.00 lakh has been made for desilting 20 such structures.

- **Wildlife Habitat Improvement (Water Holes):** The influence of wildlife management with the goal of maintaining wildlife population and the entire biodiversity at maximum level and maximum ecosystem utilization depend heavily on the knowledge of mineral elements in the nutrients requirement of animals. Salt licks are deposit of mineral salts used by animals to supplement their nutrition, ensuring enough minerals in their diets.

  Provision of Rs.37.50 lakh has been done for this activity.

- **Support for veterinary services: Support for veterinary services:** As and when required support of a trained veterinarian will be sought for treatment and care of the wild animals. Veterinary services will be taken for:
  - Clinical services (treatment of diseased animals)
  - Preventive services (avoiding the outbreak of diseases)
  - Provision of drugs, vaccines and other products

NIRRENDRA NATH
Project Officer
Magadh Project
PO-Magadh OCP

Divisional Forest Officer
DFO, Hazaribag, Wild Life

CCF Wild Life
वन्य प्राणी, झारखण्ड, राँची

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

Provision of Rs.72.00 lakh has been done for this activity.

- **Contour trenches:** Contours in the forest area helps in reducing erosion and improving water recharge through arresting runoff water and soil.

  Provision for contour trenches in 200 ha has been made under the plan.

- **Gabbion plantations:** provision for 10000 gabbion plantations has ben done for improving the natural environment for housing of birds.

  Provision of Rs.45.00 lakh has been done for the same.

Component 04: Anti- Depredation Activities

- **Torch distribution, Jute bag made marshal distribution and others among wildlife affected population /Forest personal:** Animals usually move away from lights. Distribution of torches and Mashal will help villagers in keeping the wild animals away from human population. By lighting mashal people can drive away animals in the forest when they come closer to habitations.

  Provision of Rs.15.00 lakh has been made for the same.

- **Rescue cages:** Rescue cages will be procured for reducing damage done to the teeth and nail of the captured wild animals due to the iron rod or mesh. These are cages which are safer for wild animals and help in transport easy.

  Provision of Rs.3.00 lakh has been made for the same.

- **Provision of a rescue van with all facilities**: rescuing injured animals has always been a challenge as the various needs of the animals need to be met with.

  Provision of Rs. 35.00 lakh has been made for the procurement of the rescue van.

- **Provision for anti depredation material as per need:** Anti depredation materials have been in use by the department and communities to drive away the wild animal once they come close to villages. It keeps the casualties at minimum and helps communities to counter elephant raiding and attack by other animals.

PO-Magadh OCP

NARENDRA NATH
Project Officer
Magadh Project

DFO-Hazaribag Wild Life

Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

Provision of Rs. 20.00 lakh has been done for this activity.

- **Snakes Catching Equipments:** Despite the fact that most of the snakes found in the forest are non poisonous people die due to snake bite from the fear. It will be important to distribute snake catching equipments to the persons having skill to catch snakes. Training to catch snakes will also be important

  Provision of Rs. 1.75 lakh has been done for this activity.

- **Training to trackers/watchers:** Wild animals generally come out of their safe zone during wee hours to nearby water bodies and fringes of villages in search of food. This makes them susceptible to have confrontation with humans and result in subsequent man-animal conflict.

  Provision of Rs. 15.00 lakh has been done for this activity

- **Camera traps:** To track and keep movements of animals in direct supervision camera traps are a better tool. These also help in animal census with proper evidence.

  Provision of Rs.32.00 lakh has been made for it.

- **Animal Rescue and treatments:** Animal welfare describes how an animal is coping mentally and physically with the conditions in which it lives. Contemporary animal welfare practice has moved beyond only providing the five freedoms and focuses on animals having a Life Worth Living. This encompasses both physical and mental wellbeing, and includes the ability to demonstrate natural species-typical behaviours.

  Provision of Rs. 40.00 lakh has been done for this activity

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Project Officer Magadh Project	Divisional Forest Officer Wild Life Division, Hazaribag	मुख्य वन संरक्षक वन्य प्राणी, झारखण्ड, राँची

01-12-23

SADALA SATYANARAYAN
Project Officer
Magadh OCP

- **Solarisation of the buildings:** Solar based systems will be uilt on the different buildings for reducing dependency on the grid electricity and also to reduce the emission from the use of grid electricity.

  Provision of Rs.20.00 lakh has been done for this.

- **8 trackers @10500/month for 10 years:** To keep a vigil on the offenders it require to use technology supported by manual operation. Trackers will be hired round the year for keeping a vigil on the offenders. These will also work as guide for the vistors in the sanctuaries and wild life habitats.
  Provision of Rs. 100.80 lakh has been made for it.

- **Vehicles for monitoring on rent (with driver, diesel and fuel)for CF and other higher officials:** Two vehicles will be hired for monitoring by the officers apart from the DFO of the division. These vehicles will also have provision for drivers and fuels along with maintenance.

  Provision of Rs.72.00 lakh has been made for it.

- **Vehicles for patrolling on rent (with driver, diesel and fuel) for RFO:** At the range office a vehicle will be hired for the movement of the RFO and it will also have provision for diesel and driver along with maintenance.

  Provision of Rs.62.40 lakh has been made for it.

PD-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild LIfe
मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

- **Procurement of one wireless set of handsets walkie talkie for communication for patrol:** Wireless set will help in keeping in touch while in forest during the patrolling. It will help in better coordination and management of the wild animals in the area.

  Provision of Rs.30.00 lakh has been made for it.

- **Tranquilizing guns with medicines:** Tranquilizing guns with medicines will be procured for use by the trained staff to reduce damage to wild animal and human populations also.

  Provision of Rs.20.00 lakh has been made for it.

- Drone surveillance: Drone surveillance system will be procured and deployed for keeping track of the offenders with vehicle. These drone systems will help in tracking and arresting the fleeing offenders.

  A provision of Rs. 23.10 lakh has been kept for it.

- Safety kits: Safety kits will be procured for the front line workers who participate in raids carried out by department.

  Provision of Rs.24.21 lakh has been kept for it.

Component 05: Facilitating monitoring and evaluation

- **Maintainance of vehicles and cost for driver of rescue van:** One Tempo travler ambulance for animals rescue for Hazaribag wild life Division and for people injured in the man animals conflict will be procured and it will be maintained along wth driver under the proposed plan.
  Provision of Rs.60.00 lakh has been made for it.

- **Refurbishment and maintenance of the old buildings**: There are many buildings that has been nuilt at serene locations with potential of eco tourism but has been lying unutilized. Those buildings will be developed and maintained.

  A provision of Rs. 73.00 lakh has been made for it.

PO-Magadh OCP

NIRPENDRA NATH
Project Officer
Magadh Project

DFO-Hazaribag Wild Life

Divisional Forest Officer
Wildlife Division, Hazaribag

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01.12.23

SADALA SATYANARAYAN
Project Officer
Magadh OCP

- **Procurement 1 computer desktop & printer hard ware setup for Range and wage of Computer Operator (1):** To keep track of progress and make it in digital form for convenience of every one a computer with all accessories like printers has been kept in provision. This will help in making proper records.

  A provision of Rs. 45.80 lakh has been made for it.

- **Provision for consumable for vehicles and offices:** Cost for meeting daily requirement for vehicles and offices will be provided under the plan. A sum of Rs. 37.00 lakh has been made under the plan.
- **Research biologist:** Support of a research biologist will be at the services of the DFO and provision for Rs.48.00 lakh has been done.
- **Support of two professionals:** To assist the DFO two professionals aill be placed at the DFO's office. A provision of Rs. 84.00 lakh has been done for it.
- **Contingency and escalations:** A contingency reserve will be maintained throughout the project time period so as to compensate for any accidents or loss which might take place at that period of time.

Plan Period:

The proposed plan will be for a period of 10 years from the first year of implementation.

Monitoring and evaluation:

A committee shall be formed under Chairmanship of DFO of the respective division. Other members of committee would be concerned Forest ACF, concerned Range Officer apart from two representatives of User Agency. Other members of the committee will be included as and when decided by the DFO.

PO-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

DFO-Hazaribag Wild Life
Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild LIfe
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वन्य प्राणी, झारखण्ड, राँची

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

Summary of the proposed Wild Life Management Plan for Magadh OCP				
		Proposed budget in lakh INR		
Sl no	Component	Chatra South Division	Hazaribag Wild Life Division	Total
1	Bio Diversity Enhancement	1919.48	856.00	2775.48
2	Measures for Forest Protection, Anti-depredation and wildlife protection	316.50		316.50
3	Capacity building and procurement of anti- depredation items	226.65	477.25	703.90
4	Fire Prevention and Protection of Habitat	251.55	140.50	392.05
5	Capacity building to local people in fringe villages	291.00	122.00	413.00
6	Capacity building of forest department for implementing ,monitoring and supervision of plan	386.00	334.80	720.80
7	GIS and remote sensing for implementation and Monitoring	121.00		121.00
8	Awareness promotion about Medicinal Plants and protection of endangered species	318.10	30.00	348.10
9	Corpus Fund	100.00		100.00
10	Contingency	100.00		100.00
11	Cost escalation@20%	806.06	392.11	1198.17
	Grand Total	**4836.34**	**2352.66**	**7189.00**

12/6/23
PO-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

DFO- Chatra South
सबा आलम अंसारी, भा.व.से)
वन प्रमंडल पदाधिकारी,
चतरा दक्षिणी वन प्रमंडल

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Divisional Forest Officer
Wildlife Division, Hazaribag

CCF- Wild Life
मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

8.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
A	**Biodiversity Enhancement**											
A.1	Forest Restoration by method of Silviculture and gap filling plantation - 300 hectare	206.00	37.50	8.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	259.50
A.2	Afforestation on degraded land, hill , blank patches, 150 hactare	150.00	72.00	35.00	24.00	24.00	10.00	10.00	12.00	12.00	12.00	361.00
A.3	bamboo plantation 100 hactare	86.24	32.64	12.85	11.25	0.00	0.00	0.00	0.00	0.00	0.00	142.98
A.4	Salt Licks (@ Rs 80000 per annum * 10 years	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	8.00
A.5	water holes (Rs 40000 per hole * 100 holes)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	4.00
A.6	Provision for water tanker for wildlife and forestary with lifting pump, driver, POL and maintenance	19.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	59.00
A.7	Conservation Measures for bird species: conservation measure for SCS(species of conservation significance)(woodland, grassland, water and migratory bird)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	100.00
A.8	Cotour Cutting + Soil water Conservation as per the PCCF Devlopment order 36 date 18.8.2019 having 100 man-days per hectare for a total area of 600 ha(@ Rs 350 * 100 workers * 600 ha)	35.00	35.00	35.00	35.00	35.00	35.00	0.00	0.00	0.00	0.00	210.00
A.9	Checkdam Pakka 15 in numbers each costing 15 lakbs	60.00	60.00	60.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	225.00
A.10	Loose boulder check dam in Nallas	15.00	15.00	15.00	15.00	15.00	0.00	0.00	0.00	0.00	0.00	75.00
A.11	Creation of Ponds 15 in Numbers @6 Lakhs	18.00	18.00	18.00	18.00	18.00						90.00
A.12	Earthen Checkdam 15 in numbers @6 Lakhs	18.00	18.00	18.00	18.00	18.00						90.00
A.13	Maintainance and repair of pakka and Earthen Checkdam,LBCD an ponds mentioned above in Sl. No. A.9, A.10, A.11, A.12	0.00	0.00	0.00	0.00	0.00	20.00	20.00	25.00	30.00	30.00	125.00
A.14	Linear Plantation along Rivers, canals, Roads total plants 20000	0.00	125.00	12.00	15.00	6.00	12.00	0.00	0.00	0.00	0.00	170.00
	SUB TOTAL	**618.84**	**428.74**	**229.45**	**204.85**	**131.60**	**92.60**	**45.60**	**52.60**	**57.60**	**57.60**	**1919.48**

NIRPENDRA NATH
Project Officer
Magadh Project

Conservator of Forests
Hazaribagh Circle, Chatra

SADALA SATYANARAYAN
Project Officer
Magadh CCP

Divisional Forest Officer
Chatra South Forest Division

Regional Chief Conservator of Forests
Hazaribagh

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
B	**Measures for Forest Protection, Anti-depredation and wildlife protection**											
B.1	Deployment of 10 Home Guards @ 20000 per months	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	240.00
B.2	Logistic and deployment cost of Home Guards	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	72.00
B.3	Cost of mobile set @ Rs. 10000 * 10 = 100000 (considering life 5 years) and recharges	1.25	0.25	0.25	0.25	0.25	1.25	0.25	0.25	0.25	0.25	4.50
	SUB TOTAL	**32.45**	**31.45**	**31.45**	**31.45**	**31.45**	**32.45**	**31.45**	**31.45**	**31.45**	**31.45**	**316.50**
C	**Capacity building and procurement of anti- depredation items**											
C.1	Provision for Crackers and other items	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
C.2	Snakes Catching Equipments	1.25										1.25
C.3	Training to trackers/watchers	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	15.00
C.4	Rewards for information	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
C.5	Animal Rescue and treatments	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	40.00
C.6	payment towards cost of establishing wild animal rescue team including service of one veterinary Doctor @ 60000/month, one paramedics/paravet@ 25000/months and two daily wage worker @ Rs. 326.85 * 30* 12*2 person=2.40 Lakhs per year	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	127.20
C.7	Construction of machans along Paddy fields @4000 per machan * 40 machans * 2 items	1.60					1.60					3.20
	SUB TOTAL	**25.07**	**22.22**	**22.22**	**22.22**	**22.22**	**23.82**	**22.22**	**22.22**	**22.22**	**22.22**	**226.65**
D	**Fire Prevention and Protection of Habitat**											
D.1	Fire line creation for 50 km @ Rs. 30500 per km * 50 km	15.25										15.25
D.2	Maintainance cost of fire line having 20 mans day per km every year @Rs. 350.00 per day *20 person* 50 km*10 years	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	35.00
D.3	Construction of 2 watch tower cum temporary shalter with solar and water facilities @12.00 Lakhs	24.00										24.00
D.4	2 watchers at each tower ie total 2 watchers @Rs.10050.00/months	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	50.40
D.5	Fire Fighting squard Cost of wages of fire watchers for 4 months @Rs 350 per day* 30 day* 5 months*10 years * 10 persons	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	52.50
D.6	Fire fiflhting equipments											
D.6.i	cost of mobile set @ Rs. 10000*6(two times in 10 years) and recharge	1.20	0.20	0.20	0.20	0.20	1.20	0.20	0.20	0.20	0.20	4.00

SADALA SATYANARAYAN
Project Officer
Magadh OCP

NIRENDRA NATH
Project Officer

Conservator of Forests
Circle, Chatra

Divisional Forest Officer
Chatra South Forest Division

Regional Chief Conservator of Forests

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
D.6.ii	Cost of fire fighting suit @ Rs 7000 per person (considering life 5 years)	0.70					0.70					1.40
D.6.iii	Cost of rented vehicles @50000 per months * 6 months	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
D.6.iv	Purchase of fire blower @ Rs. 60000*10 blowers = Rs. 6.00 Lakhs	6.00										6.00
D.6.v	Running and maintainance of fire blower and cutting @ Rs. 30000 per blower per year * 10 blower	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
D.6.vi	Purchase of brush cutter @Rs. 30000 * 10	3.00										3.00
	SUB TOTAL	69.94	19.99	19.99	19.99	19.99	21.69	19.99	19.99	19.99	19.99	251.55
E	**Livelihood improvement and capacity building to local people**											
E.1	Providing alternate livelihood support											
E.1.i	Farming of Medidinal Plants ,Duchary, fishary, honey bee keeping, mushroom cultivation etc. @ 9 Lakhs for 5 years	9.00	9.00	9.00	9.00	9.00						45.00
E.1.ii	Distribution of Sal plates making machine and other equipments	2.00	2.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	36.00
E.1.iii	Bamboo craft making	1.50	1.50	1.50	1.50	1.50	1.50					9.00
E.2	**Capicity building to local people in fringe villages**											
E.2.i	solar street light @ Rs. 20000 per solar light for 500 lights	10.00	10.00	10.00	10.00	10.00						50.00
E.2.ii	Providing Grain bins @ Rs. 2000*150 bins	3.00										3.00
E.2.iii	Long range rechargable tourch lights @ Rs. 2000*150 torch	3.00										3.00
E.2.iv	Training and capacity building of JFMC @ Rs. 20.00 Lakhs	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
E.2.v	Seed money for implementation of micro plan for JFMC @ Rs. 2.00 Lakhs per JFMC for 20 JFMC with focus of flora of medicinal and other ecological importance	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00
E.2.vi	Construction of shelter house/barrack	35.00										35.00
E.2.vii	Water Conservation/drinking water sources with purpose to local villagers	10.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	50.00
	SUB TOTAL	85.50	44.50	46.50	46.50	36.50	7.50	6.00	6.00	6.00	6.00	291.00

NIRPENDRA NATH
Project Officer
Magadh Project

Conservator of Forests
Territorial Circle, Chatra

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCR

Divisional Forest Officer
Chatra South Forest Division

Regional Chief Conservator of Forests
Hazaribagh

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
F	**Capacity building of forest department for implementing ,monitoring and supervision of plan**											
F.1	**Equipment for Monitering**											
F.1.i	Cost of Digital camers and drone	5.00										5.00
F.1.ii	cost of night vision binocular,GPS	4.00										4.00
F.1.iii	Provision for 6 motercycle @ Rs. 1.5 lakhs per motercycle	9.00										9.00
F.1.iv	Maintainance of motorcycles @ Rs. 12000 per year per motercycle * 6 numbers	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	7.20
F.1.v	POL for six motercycle @Rs. 100/ liters, 30 liters/month per vehicles	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	21.60
F.1.vi	vehicles for monitoring on rent (with driver, diesal and fuel)for CF and other higher officials	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	84.00
F.1.vii	Vehicles for implementation on rent (with driver, diesal and fuel) for RFO	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	72.00
F.1.viii	4 unskilled JFMC members DFO/RFO for patrolling to augment work force @Rs. 8500 per months	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	50.40
F.1.ix	one multitasking technical staff to support DFO for implementetion and monitoring of wildlife Plan @40000 per month	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	48.00
F.2	**Check Naka**											
F.2.i	Check Naka buildings	20.00										20.00
F.2.ii	solar power	2.50										2.50
F.2.iii	CCTV camera for Servellance	2.50										2.50
F.2.iv	Automated road crossing	2.00										2.00
F.2.v	Annual maintainance and running cost @Rs. 1.00 Lakhs per year	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
F.2.vi	check naka duty staff in 3 members. 8hr duties for each@ Rs. 10500/months	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	37.80
F.2.vii	Cycle+ uniform + deployment etc to watchers and naka duity	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
	SUB TOTAL	79.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	386.00

NIRPENDRA NATH
Project Officer
Magadh Project

Conservator of Forests
Territorial Circle, Chatra

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Regional Chief Conservator of Forests
Hazaribagh

Divisional Forest Officer
Chatra South Forest Division

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
G	**GIS and remote sensing for implementation and Monitoring**											
G.1	RS & GIS software and accessories	10.00	0.00	0.00	5.00	0.00	0.00	5.00	0.00	0.00	5.00	25.00
G.2	Renumeration to GIS expert @Rs.35000 per month * 12 months	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	42.00
G.3	One computer operator @Rs. 20000/month * 12 months * 10 years	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	24.00
G.4	Setting up wildlife Monitoring center at CF office, Chatra	10.00										10.00
G.5	Monitoring cell at DFO office	20.00										20.00
	SUB TOTAL	**46.60**	**6.60**	**6.60**	**11.60**	**6.60**	**6.60**	**11.60**	**6.60**	**6.60**	**11.60**	**121.00**
H	**Awareness promotion about Medicinal Plants and protection of endengered species**											
H.1	**Public Awareness**											
a.	Short Film Preparation @2.00 Lakhs * 4 years	2.00			2.00			2.00			2.00	8.00
b.	Pamphlet Distribution and Nukkar Natak etc in local language for awareness @2.00 lakh per year	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
c.	Celebration of world environment Day, wildlife week etc.	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
d.	Wall Painting, Sologan, Poster etc.	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	15.00
H.2	**Nature Interpretation Center**											
i	Construction of Nature Interpration Center @ 100 lakhs	100.00										100.00
ii	Equinoing Nature Interpretation Centre	40.00										40.00
	Live Edge Fencing with Entrance Gate	20.00										20.00
	Aesthetic Plantation/ Medicinal Garden	10.00										10.00
iii	2 skilled Manpower for maintainance of center @Rs. 12545/month * 12 month* 2 persons	3.01	3.01	3.01	3.01	3.01	3.01	3.01	3.01	3.01	3.01	30.10
iv	Running expenditure @Rs. 3.00 lakhs per year	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
v	Solar panel @ Rs. 15 Lakhs	7.00		2.00			6.00					15.00
	SUB TOTAL	**191.51**	**12.51**	**14.51**	**14.51**	**12.51**	**18.51**	**14.51**	**12.51**	**12.51**	**14.51**	**318.10**

NIRPENDRA NATH
Project Officer
Magadh Project

Conservator of Forests
North Circle, Chatra

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Regional Chief Conservator of Forests
Hazaribagh

Divisional Forest Officer
Chatra South Forest Division

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
I	**Corpus Fund**											
I	Corpus Fund for ex Gratia Payment (Lumpsum Rs. 10 lakhs) to be topped up on advice by CWLW amount to be disbursed based on demand note from DFO	100.00										100.00
II	Contigency amount	10	10	10	10	10	10	10	10	10	10	100.00
	SUB TOTAL	110.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	200.00
	GRAND TOTAL	1259.01	610.11	414.82	395.22	304.97	247.27	195.47	195.47	200.47	207.47	4030.28
	Escalation @20%	251.802	122.022	82.964	79.044	60.994	49.454	39.094	39.094	40.094	41.494	806.056
	Total Cost											4836.34
	Note:- The Proposal Activities Shall be Implemented within 10 km radius of the lease area of Magadh Coal Block											

2/6/23
PO-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

DFO-Chatra South Forest Division
Divisional Forest Officer
Chatra South Forest Division

CF-Chatra
Conservator of Forests
Circle, Chatra

RCCF-Hazaribag
Regional Chief Conservator of Forests
Hazaribagh

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

Wildlife Conservation and Management Plan (Mitigation Measure)- Activities proposed in Hazaribag Wild life Division For the period of 10 yrs (All amount in lakh INR)				Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year7	Year-8	Year-9	Year-10
Items Proposed	*Unit cost in lakh INR*	*Total Units*	*Financial Outlay*	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin
Component 01: Awareness Generation & Capacity Building													
1 Wildlife signages installation in affected villages and approach	Ls		12.00	3.00	3.00	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
2 Training and awareness to EDCs, in schools, Village Level volunteers for wildlife conservation & protection with man - wild animal conflict mangement	Ls		20.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
3 Training to Forest force for assisting trainquilising gun with doses for different wild animals with resource person	0.2	50	10.00	5.00	5.00								
4 Provision of feeding trough for cattle in villages			20.00	5.00	5.00	5.00	5.00						
5 Solarised livelihood station	12.5	2	25.00	12.50	12.50								
Sub Total component-01			87.00	27.50	27.50	7.75	7.75	2.75	2.75	2.75	2.75	2.75	2.75
Componenet02: Fire management													
6 Fire Fighting Equipments and its maintenance			23.00	10.00	10.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
7 Fire Management squad	52.5	1	52.50	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25
8 Fire fighting vehicle	20	1	20.00	20.00									
9 Fuel cost for fire fighthing vehicle and maitenance	0.2	120	36.00	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
10 Cost for Driver	0.2	120	24.00	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
Sub Total Component-02			155.50	41.25	21.25	11.25	12.25	11.25	12.25	11.25	12.25	11.25	11.25
Component 03: Habitat and water Management													
11 Habitat improvement through plantations of fruit bearing trees in 150 ha	1.45	150	217.50	104.10	63.87	15.66	15.15	13.68	5.04				
12 Bamboo plantation in 100 Ha	1.44	100	144.00	86.26	32.64	12.85	12.25						
13 Silvicultural operations in 200 ha	0.75	200	150.00	37.50	37.50	37.50	37.50						
14 Removal of lantata from the forest	0.15	200	30.00	10.00	10.00	10.00							
15 Checkdams	8	8	64.00	14.00	14.00	14.00	14.00	8.00					
16 Desiltataion of checkdams	3	20	60.00	15.00	15.00	15.00	15.00						
17 Wild life Habitat Improvement (Water Holes and Salt Lick)	0.75	50	37.50	7.50	7.50	7.50	7.50	7.50					
18 Support for veterinary services	0.6	120	72.00	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
19 Contour trenches	0.18	200	36.00	9.00	9.00	9.00	9.00						
20 Gabbion plantatioos	0.0045	10000	45.00	10.00	10.00	10.00	10.00	5.00					
Sub Total Component-03			856.00	300.56	206.71	138.71	127.60	41.38	12.24	7.20	7.20	7.20	7.20
Component 04: Anti- Depredation Activities													
21 Torch distribution, Jute bag made marshal distribution or others among wildlife affected population /Forest personal	Lsp		15.00	6.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22 Portable Cages with accessories or others as per need	Lsp	1	3.00	3.00									
23 Provision of a rescue van with all facilties	Lsp	1	35.00	35.00									
24 Provision for audtideoradatioo material as per need			20.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
25 Snakes Catching Equipments			1.75	0.75			0.50			0.50			
26 Training to trackers/wutchers			15.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
27 Camera Traps and maintainance			32.00	14.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
28 Animal Rescue and treatments			40.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
29 Solarisation of the forest buildings			20.00	10.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00
30 8 Trackers @10500/month for 10 years	0.84	120	100.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80
31 vehicles for mouitoriug ou rent (with driver, diesal and fuel)for DFO			72.00	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
32 Vehicles for patrolling on rent (with driver, diesal and fuel)			62.40	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.28
33 Procuremeut and maintcuunce of one wireless handsets walkie talkie for communication for patrol	Ls		30.00	21.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
34 Trainquilising gun with medicine	10	2	20.00	11.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
35 Drone surviilance for tracking tresspassers			23.10	23.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NIRPENDRA NATH
Project Officer
Magadh Project

01.IV.12

SADALA SATYANARAYAN
Project Officer

Wildlife Conservation and Management Plan (Mitigation Measure)- Activities proposed in Hazaribag Wild life Division For the period of 10 yrs (All amount in lakh INR)					Year1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10
	Items Proposed	*Unit cost in lakh INR*	*Total Units*	*Financial Outlay*	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin
36	Safety kits with helmet and body shield and other items for front line force			24.21	15.21	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	SubTotal Component-04			**514.25**	**170.80**	**38.74**	**38.74**	**39.24**	**38.74**	**38.74**	**40.24**	**38.74**	**38.74**	**38.78**
Component 05: Facilitating monitoring and evaluation														
37	Maintainance of vehicles and cost for driver of rescue van			60.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
38	Refurbishment and maintenance of Old buildings	Lsp		73.00	46.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
39	Computer and operator cost with GIS software			45.80	8.00	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20
40	Provision for consumable for vehicles and offices			37.00	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
41	Research biologist			48.00	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80
42	Support for 2 professionals to assit the DFO			84.00	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40
	SubTotal Component-05			**347.80**	**76.90**	**30.10**	**30.10**	**30.10**	**30.10**	**30.10**	**30.10**	**30.10**	**30.10**	**30.10**
				1960.55	**617.01**	**324.30**	**226.55**	**216.94**	**124.22**	**96.08**	**91.54**	**91.04**	**90.04**	**90.08**
43	Contingency and escalations			392.11	123.40	64.86	45.31	43.39	24.84	19.22	18.31	18.21	18.01	18.02
		Total cost		2352.66	740.41	389.15	271.85	260.32	149.06	115.29	109.84	109.24	108.04	108.10

NIRPENDRA NATH
Project Officer
PO- Magadh OCP
Magadh Project

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Divisional Forest Officer
DFO-Hazaribag Wild Life
Wildlife Division, Hazaribag

CCF-Wild-Life
मुख्य वन संरक्षक
रांची, झारखण्ड, रांची

Chapter-1

Introduction, background of project and impact area

Introduction:

Mining is vital for human sustenance and a crucial sector in the state economy. However, its impacts on the environment and biodiversity cannot be underestimated, which are potent to the attract government's attention. Environment and wildlife are subject to the harmful impacts of mining and its related activities. The report has tried making an assessment of impacts on wildlife adversely affected by the mining activities in the proposed area. The fauna has been observed to bring the calculated risks and threat perception of the regional wildlife in the view of the general masses and department as well. Many species of mammals, birds and reptiles have been present in the area. The report explored that mining is primarily responsible for land degradation, which lead to food and agriculture losses. Several other factors like blasting, pollution, deforestation, habitat loss was also observed. Deforestation surfaced one of the major causes for disturbance of habitat of fauna in the said region and preemptive measures are needed to seize the man-made catastrophe.

Over the past century, human population growth has facilitated land use changes at the state level and the district of Chatra is not exception to this. The energy and infrastructure required to support this human population growth can negatively impact wildlife. Anthropogenic structures constructed in previously un-fragmented landscapes, can have direct and indirect effects on local wildlife populations. For example, deep mining voids may harm the wild life by drowning and contamination of water by the coal particles and other sediments making water less suitable for drinking. Anthropogenic development may also indirectly affect wildlife populations by causing changes in animal behavior (e.g., displacement, increased predation risk, or by creating impediments to seasonal migration. The magnitude and consequences of these behavioral changes are often difficult to measure due to the absence of immediate population level effects. As such, identifying and quantifying both the direct and indirect effects of anthropogenic structures on wildlife as well as effective measures to minimize negative impacts are essential for conserving affected wildlife populations.

The potential incompatibility between wild life and anthropogenic structures led the state forest department to identify the placement, operation, and maintenance of mining operations and associated anthropogenic structures related to energy development of the district of Chatra as a conservation threat for wild life. These may

impact local wild animal populations through destruction of nests or abandonment of suitable habitats.

To reduce the potential negative impact on the wild life due to commissioning of mining projects wild life management plan need to be prepared to mitigate the negative impacts of the mining in the proposed project area.

The present documents attempts to address the issues concerned with wildlife and mitigation in regard with it.

Location of the project and status of diversion of forest land

The Magadh block is located between longitude 840 57'40" and 840 59' 30" E and latitude 230 49' 15" and 230 51' 30" N and Tandwa Block is situated between longitude 840 55' 35" and 840 57' 40" E and Latitudes 230 47'40" and 230 50' 38"N. The Dumargarhblock located between longitude 840 54'50" and 840 56' 09" E and latitude 230 48' 30" and 230 50' 56" N .The Karimati block is located between longitude 840 53'40" and 840 54' 54" E and latitude 230 48' 40" and 230 49' 40" N.

The North Karanpura Coalfield forms a part of the east west trending valley between Hazaribagh plateau in the north and Ranchi plateau in the south. The AswaPahar in the south separates the North Karanpura Coalfield and the South Karanpura Coalfield by an east-west elongated metamorphic patch. The total forest land that will be diverted will be 96.72 ha which has been approved by the competent authority.

About the project, Coal Availability and Linkage

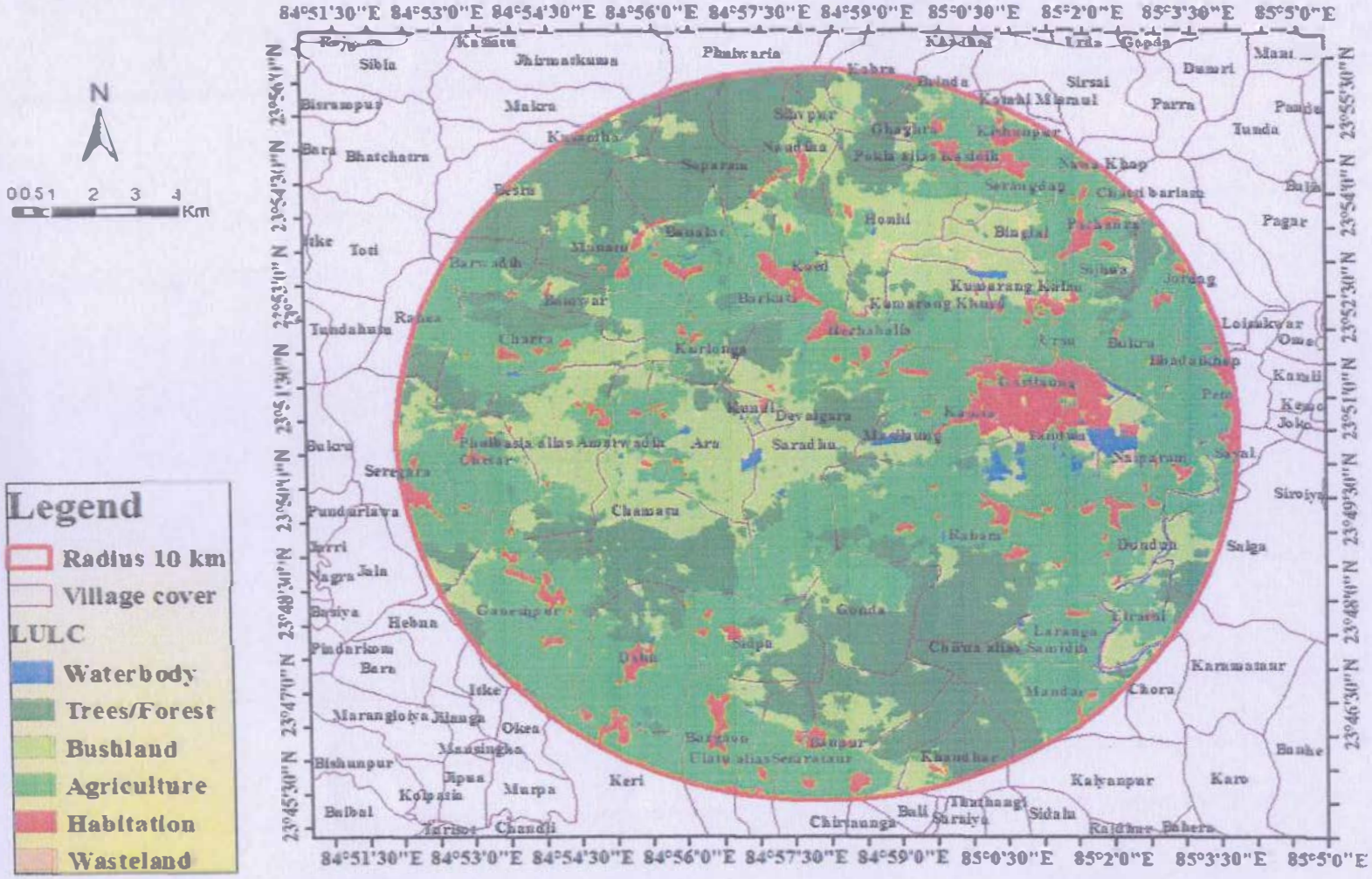
The CCL a Govt. of India undertaking company has been entrusted with the duty to supply coal to steel plants, Thermal power plants, captive power plants, cement plants and others. The demand in the power sector and in other sector is increasing constantly. So there is a need for opening of new mines.

Coal is the primary driving force for generating energy to meet the growing demand by the communities, companies and others. CCL is among the biggest players in the country for supply of coal to this very purpose. The Magadh OCP is located in the northern part of the NK coal field and lies in Chatra and Latehar district of Jharkhand. The coal block covers an area of 8.51 sq Km out of which 7.99 sq Km is coal bearing area. The project is situated in the Tandwa block of Chatra district. It falls under Tandwa range of Chatra South Forest Division. Though the project has area in the Latehar and Chatra district but all the forest area falls under Chatra district and Chatra South Forest Division.

SADALA SATYANARAYAN
Project Officer
Magadh OCP

LULC Map

TANDWA TEHSIL, CHATRA DISTRICT, JHARKHAND



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SADALA SATYANARAYAN
Project Officer
Magadh OCP

Extents of biotic pressure on forest:

Practice of open grazing contributes to biotic pressure in addition to demand for fuel wood and construction of houses. Fuel wood creates biggest biotic pressure and one family of six members uses wood equivalent to one full grown tree in one year. Large herds of less productive cattle with open grazing tramples seedlings and reduce natural regeneration in the process. Goats by virtue of their biological characteristics reduce growth of plants in to tree and create more bushes than trees.

Dependence on NTFPs, method of collection and impact on wild life:

NTFPs like mahua. sal resins, sal leaves and medicinal herbs plays an important role. Fruits like char, jackfruit, jamun, kendu and bhelwa are being collected and used for selfconsumption and for sale also.

For mahua people burn the leaves on forest floor which they do year after year. It makes oil hard and reduces moisture content and thus growth of any vegetation is limited under the crown. Sometimes this fire becomes uncontrolled and causes damage to both flora and fauna.

Resins are collected by putting a cut mark and it does not have much negative impact onflora and fauna. Medicinal herbs are collected in unscientific manner and it reduces bio diversity of the forest. It requires training and awareness to sustain the livelihoods of traditional healers itself. Fruits are collected for consumption and sale. It does not have much impact on the wild life.

Occupational Profile:-

The major occupation of the villagers in the impact area is agriculture. People do have jobs in the mines but it is very limited. Most of the other people are involved in the wage earning in the mines and related activities. Ancillary activities like transportation, small road side hotels and other petty business also find a place in the day to day earnings. Along with the major activity of cultivation allied activities like cattle rearing and small ruminant farming also makes a living for many families. Collection of NTFP also contributes to the family earnings. So a basket of activities are being taken up by community to make a living in the area.

Cropping Pattern:-

The agriculture lands available in the impact area are cultivated primarily under rain fed conditions. The total land is not utilized for cultivation because of low facility of irrigation. Kharif is the main crop in which villagers grow paddy (Oryza Sative). The

important fruit plants are Jack fruit (Artocarpus hetrophyllus), Imli (Tamarindus indicus) Jamun (Syzygiumcumini), etc.

Status of Habitat

The proposal for diversion of forest land for 226.67 Ha in Magadh Expansion OCP will constitute quarry, infrastructure etc., which will result in felling of all tree in the area. All avifauna found in the area will be displaced by the mining and allied activities. These activity will displace the habitat of all birds, animals etc. which depends upon the local plants for food, shelter and nesting. Thus the mass displacement of avifauna will occur when the mine operation will start.

There were also changes in the shrubs and woody climbers. Only 14 shrub and woody climber species were observed in areas nearer to mines against 40 species in the natural forests.

Avifauna in Magadh OCP

The various species of avifauna found in core and buffer zone of the proposal are Common myna, Small blue kingfisher, Pond Heron, Cattle Egret, Lesser pied Kingfisher, Blue rock pigeon, Indian roller, Indian tree pie, Maratha Woodpecker, Black drango, Little egret, white- Breasted King fisher, Little Green Bee eater, black kite (Common), white wagtail, Golden Oriole, Large Cormorant, Little cormorant, Blossom headed Parakeet, Rose- Ringed Parakeet, Red-vented bulbul, Indian robin, Spotted dove, Pied myna, Brahminy myna, Grey hornbill, Common babbler, barn owl, Common hoopoe. Little Green Bee Eater, Black kite(Common), White wagtail, Golden Oriole, Blossom headed Parakeet, Rose-Ringed Parakeet, Red-vented bulbul, Indian robin, Spotted dove, Pied myna, Brahminy myna, Grey hornbill, Common babbler, Barn owl.

Common plants used by the birds in the locality

The birds use varieties of plant species. They use different trees and shrubs for feeding, resting, roosting and nesting. The bushes of lantana which are considered as weed are most beneficial for birds. It provides food and breeding shelter for most of the ground dwelling birds. The most important plants which will be lost to birds of this area are- Amla, Mango, Arjun, Babool, Bel, Ber, Bans, Bargad, Peepal, Dumar, Dhoutha, Dhela,Didhour, Imli, khair, Siris, Kachnar, Kanwad, Khajoor, Kusum, Karam, Jamun, Mahua, Neem, Piar, Palas, Semal, Sal and variety of shrubs. The grasses like spear, kush, khas, dudhi are important for feeding and safety. The large trees are nesting places for kites, eagle, crows etc.

Biotic pressure on the study area

Grazing: In the absence of adequate productive pasturelands in impacts areas, forests have been become the major source of grazing and fodder for rural cattle population. Grazers also collect green fodder by lopping and harvesting grasses which adversely affects regeneration of forests and also deteriorates habitat of the wildlife. The overgrazing by the village cattle in forest area creates shortage of food for wildlife especially during summer season. The impact of grazing is clearly visible in the impact area as fodder removal and the forest has reached unsustainable levels and weeds have begun to invade.

There is no culture of stall feeding for the cattle in this area. The forest in the vicinity of thickly populated area are worst affected by incidence of grazing. In rainy season the grazing affect the forest crop badly by destroying and crushing of new forest crop - shoots. Thus the domestic live stock tries to compete with wildlife for food, fodder and water.

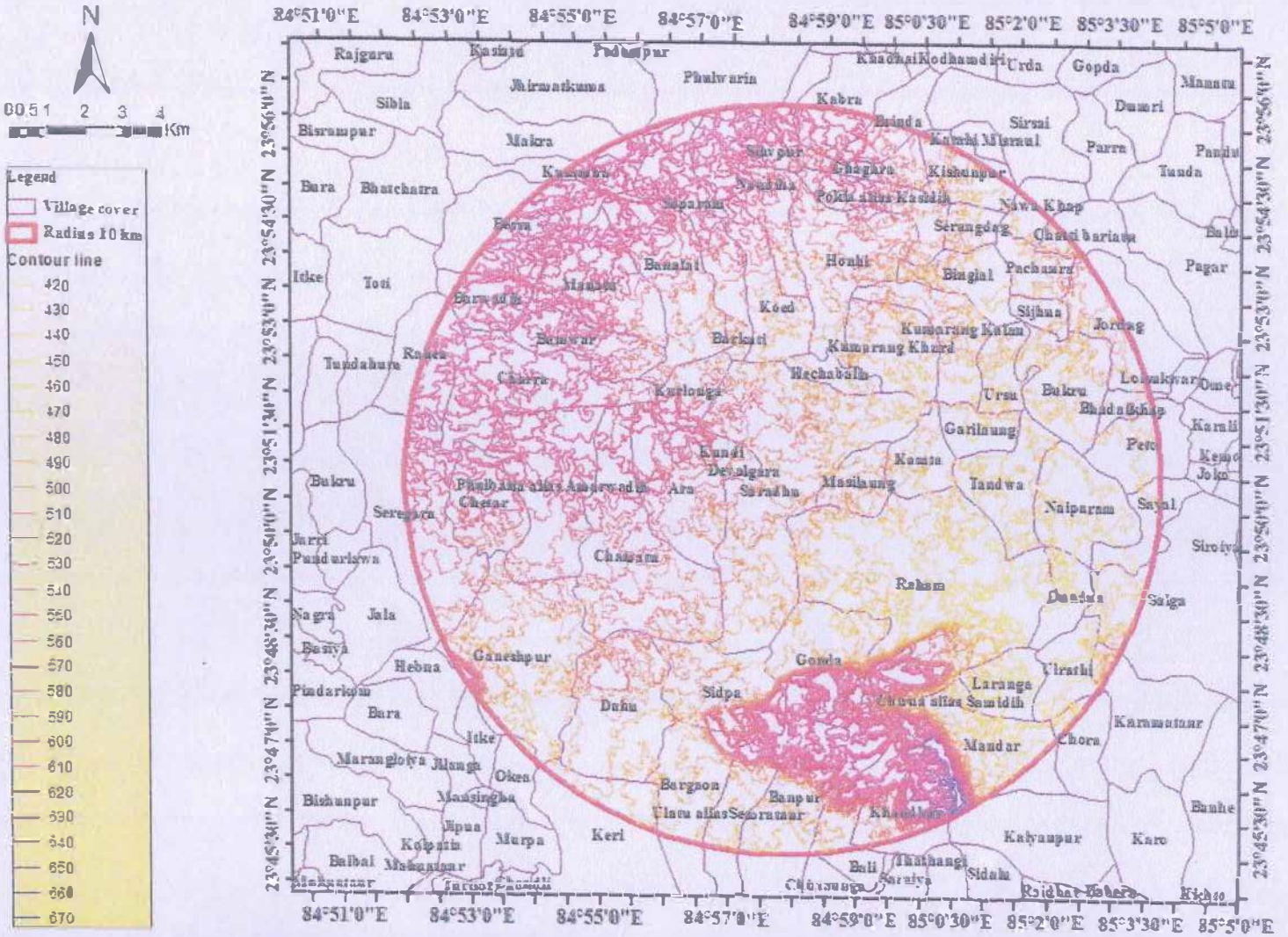
Forest fire: Forest fires in the impact area are generally ground fires. Annually a several numbers of forests are affected by fires. About 90% of fires are caused by human to promote new flush of grasses, collection of Mahua flowers, Fruits and Honey. The forest fires which are caused for different activities are major threats for the local wildlife. These fires cause significant destruction of habitats and affected slow moving fauna such as snakes, lizards, insects etc. most of the villagers mentioned that these fires were likely of natural causes. But negligence on part of industrial units mining institutions and villagers are also be a cause of those fires.

Fuel wood consumption: The surveyed indicated that the rural population of the impact arena dependent on forest biomass for cooking purposes mainly on fire wood. The respondents using fire wood were clearly said they collected fire wood from the nearby forest. The forest situated near thick populated village are worst affected. It was seen during studies that more than 65% people use gas for their cooking rest 35% depends on fire wood and coal for their cooking.

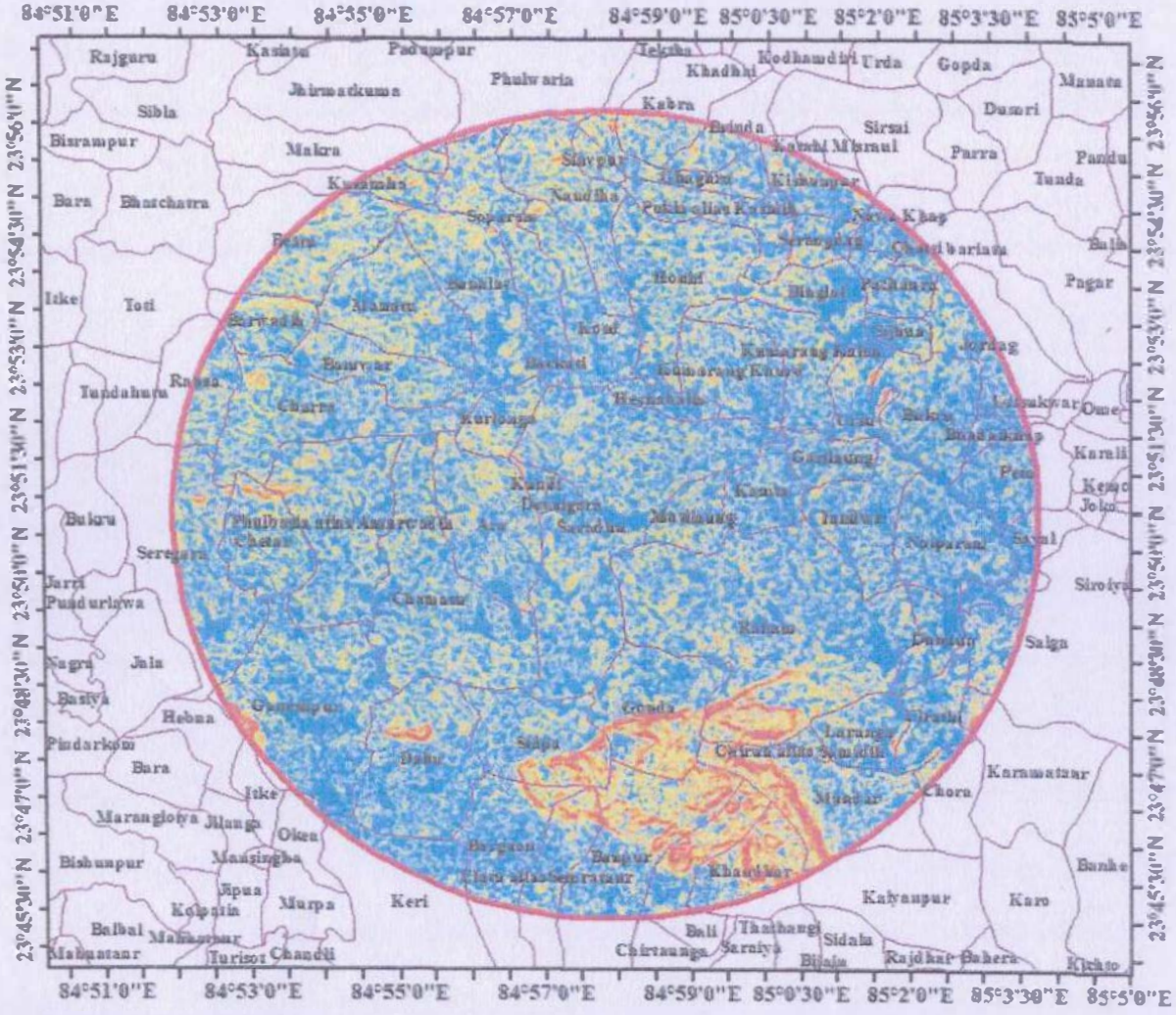
NTFP are very important to rural households in terms of their contribution to health, food, energy and other aspects of rural life. NTFP which at present contribute to rural livelihoods on a subsistence level could play a much bigger role in economic growth and poverty alleviation. NTFP covers a wide range of products (goods and services) from thatching materials to medicinal plants. These products are the essential needs of local communities.

Contour Map

TANDWA TEHSIL, CHATRA DISTRICT, JHARKHAND



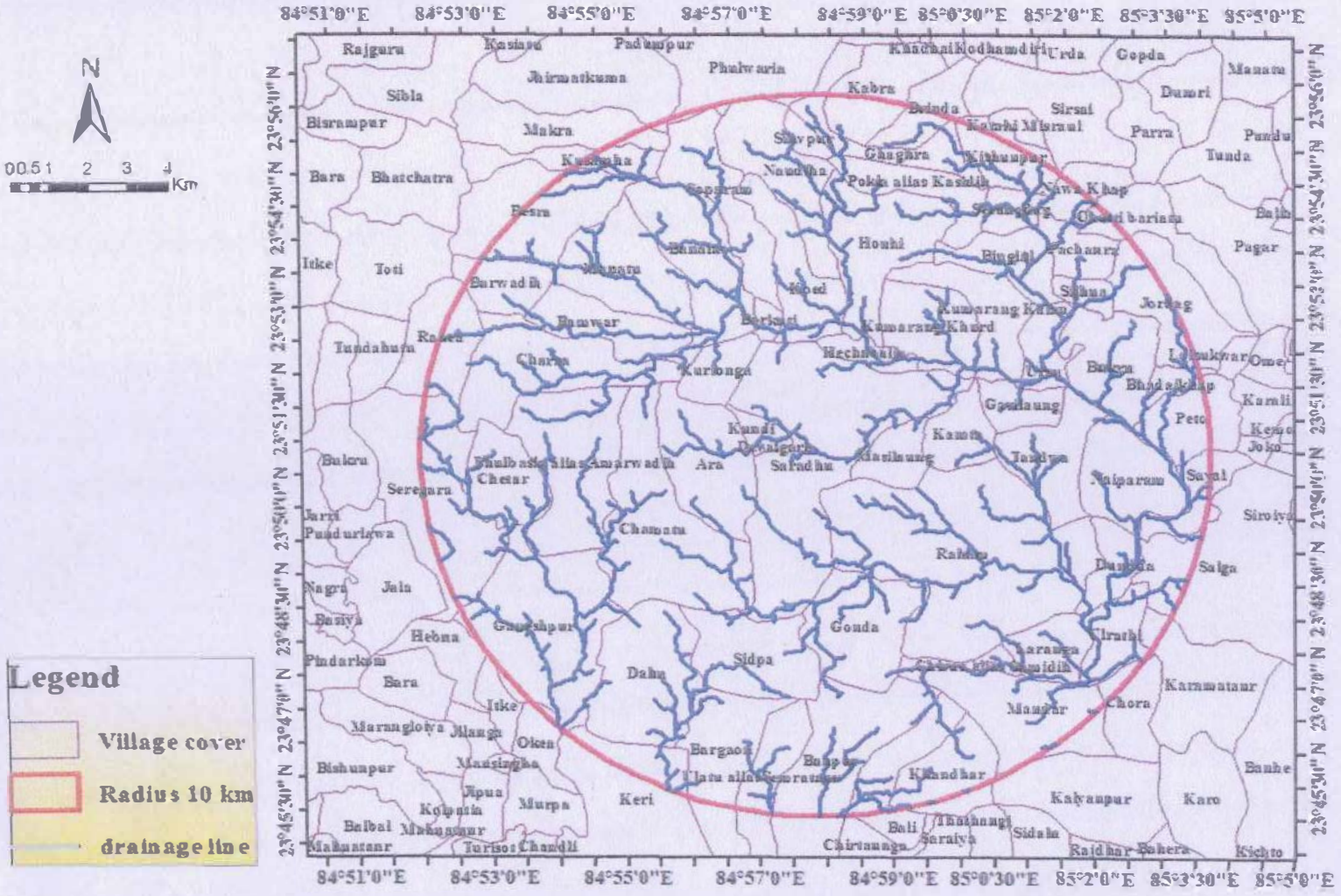
Slope Map



SADALA NARAYAN
Project Officer
Magadh OCP

Drainage Map

TANDWA TEHSIL, CHATRA DISTRICT, JHARKHAND



SADALA SATYANARAYAN
Project Officer
Magadh OCP

Climate and Rainfall: The climate is tropical. The summer, which is between April and June, is very hot. The maximum temperature reaches upto 46°C during summer and the minimum temperature reaches 4°C during winter months of December and January. The average rainfall is usually about 50"-60" during monsoon.

Details Of Linear Infrastructure In The Impact Area: The linear infrastructure in the proposed project area is road an ial networks along with the transmission lines. No new linear infrastructure is being laid in the project area.

Socio Economic Data of Magadh OCP

Socio-Economic Profile

Socio-economic study including demographic, economic, workforce, civic amenities and basic & civic amenities in the study area is based on 2011 census data.

Methodology of Sampling

The study of Socio-economic environment is an integral part of Environmental Impact Assessment (EIA). The study includes the Social profile, Economic, Infrastructure facilities, Occurrence of historical / Archaeological sites and presence of important features of the area (Core zone and Buffer zone 10 Km radius from mine lease area). All this information is collected from the census of 2011 and reported in this report.

In order to validate the census data, house hold survey of 250 households was made by floating questionnaire to the residence and local people of different villages and village head (Sarpanch / Police Patil) etc. Sample size varies as per need, time and convenience. Occupational health status of the above for the different age group and sex was also collected.

- Village boundary maps as per Census 2011 have been used to collect data; same has been attached for your reference.
- Identify District and Sub-district of Study area from Map.

Demographic Profile of the study area

The study area comprises **52** villages, with a total population of 65509 persons.

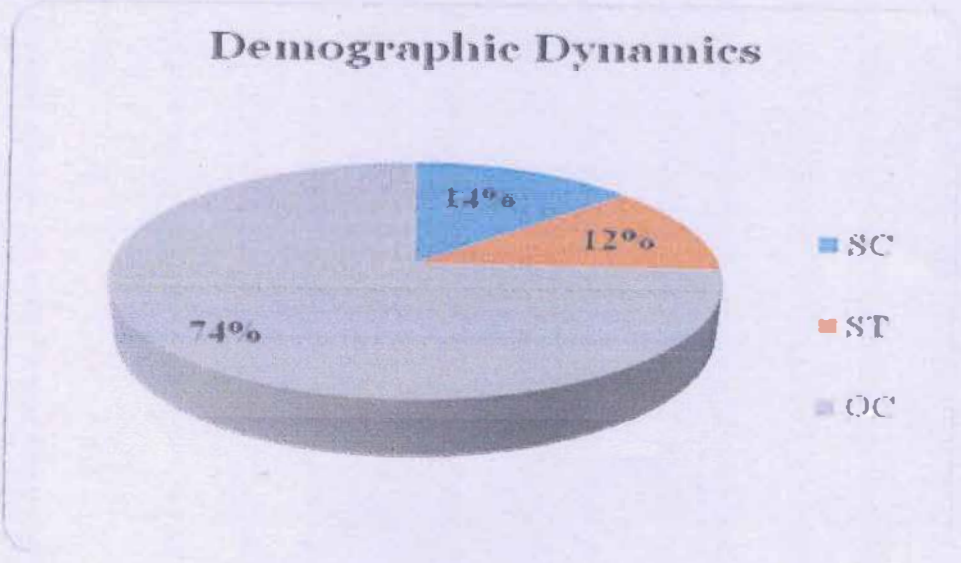
Average household size :

Average household size lies between 4 and 6 persons per family, in the study area.

Average HH Size = (Total Population) / (No of Households)

SADALA SATYANARAYAN
Project Officer
Magadh OCP

No of Households	Total Population	Avg_HH_Size (Persons)
11764	65509	5 (5.57)



Gender ratio

Gender ratio is an indicator of social status. In places where women have a better social status, there the difference between the numbers of male and female is less, the ratio is found to be close to 1:1.

Below is the summary of the same data in tabular form, representing number of female every 1000 male.

Sex ratio = (Number of females*1000) / (Number of males)

The ideal sex ratio is 1:1. From the above table, it can be observed that in study area, the number of female per 1000 male is less than required. It is at 968 female per 1000 male.

Economic Profile of the study area

The census classifies workers into two groups, namely, 'Main workers' and 'Marginal workers'. Main Workers are those who have worked for the major part of the reference period, i.e. 6 months or more. Marginal Workers are those who have not worked for the major part of the reference period i.e. less than 6 months.

The main/marginal workers are classified on the basis of Industrial category of workers in following four categories:

- Cultivators
- Agricultural Laborers
- Household Industry Workers
- Other Workers

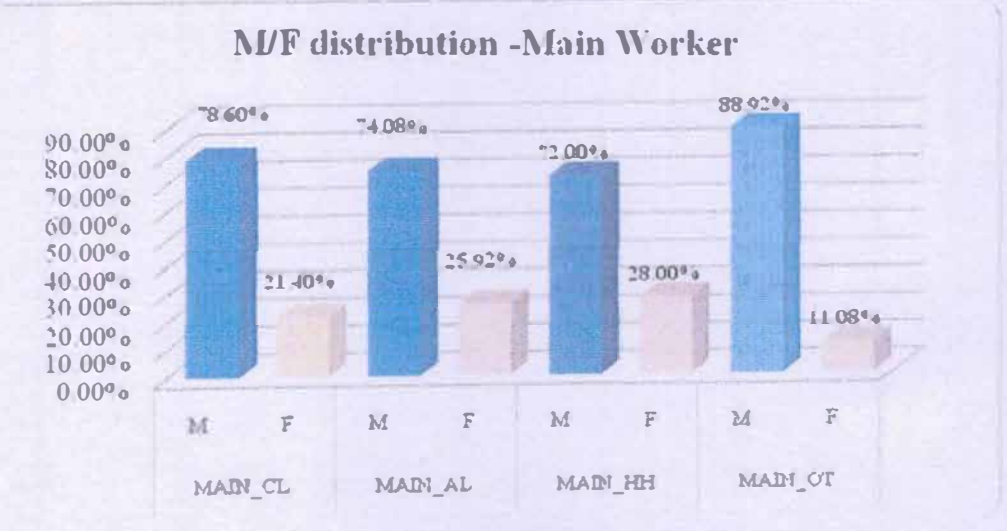
Below is the summary of the same data, in tabular and figurative form.

	WORKERS			NON_WORKERS		
	TOT	M	F	TOT	M	F
%	31.69%	76.24%	23.76%	68.31%	40.32%	59.68%

	MAIN WORKERS			MARGINAL WORKERS		
	TOT	M	F	TOT	M	F
%		86.66%	13.34%		62.09%	37.91%

	MAIN_CL		MAIN_AL		MAIN_HH		MAIN_OT	
	M	F	M	F	M	F	M	F
%	78.60%	21.40%	74.08%	25.92%	72.00%	28.00%	88.92%	11.08%

	MARG_CL		MARG_AL		MARG_HH		MARG_OT	
	M	F	M	F	M	F	M	F
%	51.59%	48.41%	49.37%	50.63%	39.00%	61.00%	78.58%	21.42%



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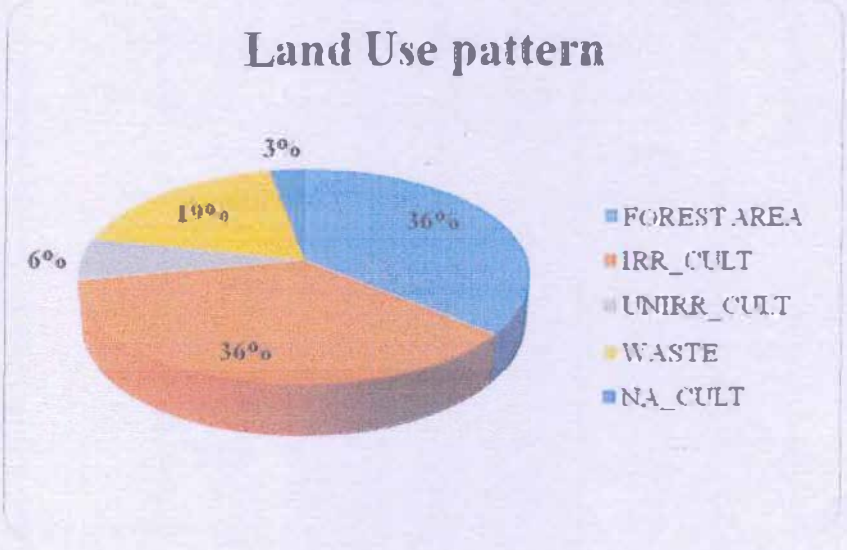
SADALA SATYANARAYAN
Project Officer
Magadh OCP

The number of female workers is less than half the number of male workers. Interestingly, among agricultural marginal workers, Females out the number of males. In urban areas, majority of Female workers are engaged in households industry and other work.

Land use pattern:

Land use and land management practices have a major impact on natural resources, including water, soil, nutrients, plants and animals. Land use information can be used to develop solutions for Natural Resource Management.



From above we can observe that % of Non- irrigated Land is much higher than irrigated land. Also, % of barren land is negligible. The study area soil conditions are favourable for forestation.

Occupational health survey

Under the Occupational Health and Safety Act, occupational illness is defined as a condition that results from exposure in a workplace to a physical, chemical or biological agent to the extent that the normal physiological mechanisms are affected and the health of the worker is impaired.

It is observed that Asthma, Hypertension and Chest disorder (TB), Paralytic attack, Cataract, Conductive Hearing Problem (CHB), Coronary Artery disease (CAD) and Dislipedimia(Cholesterol) are common in people of old age group (> 40 years). Malaria, Jaundice, Dysentery/Diarrhoea and Skin diseases are common in all age groups.

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SADALA SATYANARAYAN
Project Officer
Magadi OCP

Public awareness and opinion about the project

Most of the respondents are aware about the project. 85% respondents have favourable opinion, 10 % have unfavourable opinion and 5 % have not given any opinion.

The respondents were asked to opine about the project. They expect increase in job opportunities, improvement in educational, transport, medical, housing, sanitation facilities.

Project benefits

The implementation of the project will improve the socio-economic status of the joining areas and will help to meet the energy demand of the nation. Project will lead to development of ancillary industries and an overall economic growth of nearby towns to supplement the population of the area.

The project is likely to give a boost to the economy of the area and providing primary and secondary employment to local people. There will be improvement in infrastructure facilities like drinking water, medical, educational, schools etc. There will be overall gain with respect to improvement in social and economic aspect. This will lead to the overall development of the society.

Description of the flora and fauna

The forests of Chatra are mostly over hills and undulating lands. This unproductive nature of the soil coupled with low rainfall and high drainage reflects itselfthe poor condition of the growing stocks, which has been accentuated by heavy tree felling over grazing and fire. In some cases, the proposed rotation has been transformed into a scrub due to human interference. The anthropogenic factors have let loose severe erosion which has continued over the past several decades and brought down the productivity. Although in several patches there are dense forest cover still preserving theoriginal habitat and bio-diversity. At the onset of summer all the trees shed their leaves, remaining leafless for about 6 months in a year. The fallen leaves increase the fire hazard and before adding nutrients to the soil, are burnt every year. The ashes are washed out of the forests by next monsoon.

Sal & Palash are predominant species with its associates. Some areas have miscellaneous forests with species like Kend, Arjun, Sidha, Mahua, etc. Sal is generally confined to plains, narrow valleys and foothills of hills. Because of severe problem of grazing and hot climate, moisture retaining capacity of soil is very low. Soils havebecome impoverished. As a result, xerophytic plants like Salai, Bamboo, Khair, Harsingar out number other species. Type of forest is the resultant

SADALA SATYANARAYAN
Project Officer
Magadh OCP

reconciliation of the floristic inheritance of the locality with the habitant. A forest type can be defined as a unit of vegetation possesses broad characteristics in physiognomy and structure, sufficiently pronounced to permit its differentiation from other such units. Usually, a forest type is described with reference to its geographical location, climatic and edaphic features, composition and condition. The upper forest canopy in the region is light but probably fairly even and continuous in the climax form, the latter is however very rarely encountered and an irregular often broken canopy is usual in consequence, the tree is having a relatively short bole and poor form, and a height rarely over 15 m and often lesser. The canopy is formed entirely deciduous trees, most of which extend to moist deciduous forest with far better development. There is considerable inter-mixture of rather smaller trees, which in this moist deciduous they may be in the second story. There is usually thin shrubby undergrowth.

There is a great impact of geology on the distribution of forests in the region. The relative compositions of crop are found according to aspect, biotic factors and topography. Miscellaneous forests occur in all the zones. Some where it is confined to a small patch. In upper storey are *Anogeissus latifolia*, *Terminalia belerica*, *Terminalia chebula*, *Adina cordifolia*, *Butea monosperma*, *Diospyros melanoxylon*, *Cassia fistula*, *Lagerstromia parvifolia*, *Sterculia urens*, *Albizzia sps*, *Buchannia lanzan* , *Aegle marmelos etc. In the under storey are found Holehhrena antydysentrica*, *Croton oblongifolius*, *Nycatanthes arbostristis*, *Ziziphus sps*. The commonest climbers are Bauhinia vahlii.

Tree species present in the tract belong to several families. The prominent families are Dipterocarpaceae, Ebenaceae, Fabaceae, Anacardiaceae, Flacourtiaceae, Lytheraceae, Mimosaceae, Rubiaceae, Sapindaceae, Tiliaceae, Arecaceae, Bombacaceae,Combretaceae, Moraceae, Meliaceae and Euphorbiaceae.

Regeneration Status

The natural regeneration appears to be a complex process. Most of the species do not exhibit the same type of liking to all the localities within forest. They favor certain type of areas to regenerate profusely. The dominant species regenerate under their own shade. At the dawn of the favorable season, the natural regeneration of the important species can be found to be prolific. Along the banks of the streams, nalas, river and valley are where the conditions are more favorable accelerating the rate of regeneration of species.

Fauna Diversity

Historic data indicates presence of the major carnivores in the past, including tiger,

leopard, wolf, hyena and fox in the area. However, tiger and leopard which were once seen frequently, has no trace now. Among the vertebrates, documented information is available only for Mammalian, Reptiles and Avifauna. However, other vertebrates like Amphibians (frogs, toads) are also found. Recent studies on reptiles in Jharkhand revealed 25 species of snakes, 8 species of lizards in the state. Snakes serve the mankind in different ways which go unnoticed. The two economic aspects of the snakes are their role in nature as destroyers of insect and rodents. Among snakes, Spectacled Cobra, Banded Krait, Common Krait, Russell's viper, Green Pit-viper are poisonous. The common non –poisonous snakes are India Rock Python, Rat Snake, Checkered Keelback and Buff-stripped Keelback etc. Among Lizards, Monitor Lizard, Indian house gecko, Rock lizard, Common Garden Lizard and Skink etc. are found. Indian Rock Python (Python *morulus*) belong to Schedule-I species. Monitor Lizard (Varanus monitor) is listed in Sch.II

As regards invertebrates, except for little documentation, there is no proper scientific documentation whatsoever. However, a number of invertebrates exist in the area ranging from Annelids (earthworms, Centipedes, millipedes) Moluscans (Snails and slugs) to a variety of insects including beetles, bees, butterflies, bugs moths, crickets, grasshoppers, termites etc., which are not only abundant but diverse in nature.

Among recorded mammals Elephant (Elephas maimus), Pangolin (Manis crassiicaudata) and Sloth Bear (Melursus ursinus) are enlisted in Schedule-I of wildlife (Protection) Act, 1972 and the others are in Sch. III and IV.

The destruction of wildlife corridors due to development projects causes disturbace of biodiversity of the region. A wildlife corridor or green corridor is an area of habitat connecting wildlife populations separated by human activities. This allows an exchange of individuals between populations, which may help prevent the negative effects of inbreeding and reduced genetic diversity (via genetic drift) that often occur within isolated populations. Corridors may also facilitate the re-establishment of populations that have been reduced or eliminated due to random events. This may potentially moderate some of the worst effects of habitat fragmentation. Wildlife corridors are susceptible to edge effects; habitat quality along the edge of a habitat fragment is often much lower than in areas further from the habitat edge. Wildlife corridors are important for large species requiring significant sized ranges; however, they are also vital as connection corridors for smaller animals and plants as well as ecological connectors to provide a rescue effect. Elephant corridors are narrow strips of land that allow elephants to move from one habitat patch to another. There are 88 identified elephant corridors in India. The elephant habitats of central India are spread over an area of 17,000 km2 in the states of Jharkhand, Orissa and a part of

southern West Bengal. The 2500 elephants in the range occupy the most fragmented elephant habitat of the country that has been degraded and fragmented due to mining, shifting cultivation and developmental activities (The Right of Passage, Wildlife Trust of India). Jharkhand has two distinct elephant populations, viz. Palamau and Singhbum and about 700 elephants. The Palamau population occupies about 1200 km2 of the Betla National Park, Palamau Tiger Reserve and adjoining areas. The forest area of project site of the concerned Forest Division is not a part of already identified 14 corridors in India (The Right of Passage, Wildlife Trust of India). Apart from this although no other scientific study has been made to identify corridor of wild animals like elephant in the project area yet very limited movement of elephant was reported in few villages under Chatra Forest Division.

Description of the flora and fauna: Habit and habitat of some important animals found in the forest of Bermo range under Chatra South Forest Division

The following photos of different wild animals are from the field of project and its impact areas sited and collected during and before the course of preparation of the site specific wild life management plan. The habitat requirement, feeding & breeding behaviour of some important animalsfound in and around project area are as follows: -

Elephant

Common Name: Indian Elephant Scientific

Name: Elephas maximus indicus

Habit: Elephant are social animals and may form herds of 20-30 individuals led by the oldest female. Herds usually break into stable family groups of 4-7 animals for foraging and may rejoin. Elephant is intolerant of hot summer and retreats into a shady spot during noon. In the past, when forest ranges were continuous, elephants used to migrateseasonally in search of better pastures alternating with forests. Human activities like cultivation, highways, townships, railways, dams, industries and mines have now fragmented their habitat and made seasonal migrations virtually impossible. Elephants enjoy cultivated foods such as ripe paddy, banana, mango, jack fruit, sugar cane.

Habitat: Elephants are animals of grass lands and scrub forests who have secondarily switched over to forests once grass lands were mostly brought under cultivation. The mosaic of grass, scrub forests, open forests and dense forests suits them well. Elephants consume a variety of diet, bark, roots, leaves, stems

SADALA SATYANARAYAN
Project Officer
Magadh OCP

and twinges, bamboos, vines, shrubs belongings to 100 plus species. An average day's intake for adults is 150 Kg of vegetation (20-25% body weight). Elephant may drink 100-140 liters of water at least once in a day.

Threats:

i. Habitat loss and fragmentation due to encroachment of forest.
ii. Poaching for tusk.
iii. Forest fire
iv. Conflict with human beings.

Conservation issues

i. Raid in the village and agricultural field for food leads to man-animal conflicts.
ii. Loss of habitat for food and water.
iii. Particular attention should be paid to identifying ways to reduce human conflict through promotion of methods that ensure to keep the elephant away from human.
iv. Unawareness among the people. Awareness programme to reduce conflicts.

BLUE BULL

Scientific Name: Boselaphus tragocamelus

Local Name : Nilgai

The Nilgai (Boselaphus tragocamelus), is the largest Asian antelope. Nilgai, also known as Blue Bull, is one of the most commonly found wild animals of northern India as well as eastern Pakistan. Even though it is an antelope, it looks quite similar in appearance toan ox. Therefore, it has been given the name of Blue bull in India. The average lifespan of the Blue bull is 21 years. This is the largest antelope found in the division. The adult bull has a coarse iron-grey coat, a white ring below and two white spots on each cheek. Young bulls and cows are tawny. Bulls have stout come like horns-but not long. Blue bull avoid dense forests. Their usual hunts are hills sparsely dotted with trees, or level orundulating plains covered with grass and patches. Blue bull are very bold in cultivated fields. They feed upon grasses, leaves and wild fruits till late in the morning and evening and seek shade during the day specially in hot summer days. Nilgai like other antelope have habit of resorting to the same spot to deposit their droppings, forming in this way considerable accumulations.

Natural Habitat Nilgai is a diurnal creature, found inhabiting Indian grasslands and woodlands. It avoids dense forest and has preference for plains and low hills with shrubs. Blue bulls generally come to the same place to deposit their droppings.

Behaviour Nilgai antelope is a sociable creature, usually found in single-sex or mixed- sex herds. The membership of a herd may be anywhere between four and

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

twenty. In winter, male blue bulls of northern India are known to form herds of 30 to 100 animals. Male Blue bulls, after they reach old age, may be found leading a solitary life. One can also come across individual male or female in cultivated or semi-urban areas.

Diet Blue bulls of India are herbivorous creatures, surviving primarily on grasses, leaves, buds, and fruits. Blue bull can survive for a long period of time without water. Generally, Blue bull prefers the mature growth stage of different crops (e.g., paddy, maize, mustard, chili, cauliflower, cow-pea, black gram, cabbage, etc), while wheat,

potato, radish and pumpkin are preferred in the early stages of growth, and lentils are preferred at all stages. Blue bulls were reported to feed on all the major crops grown in the boundary areas. Apart from agricultural crops, Blue bulls also caused considerable damage to vegetables.

Conservation Status

Nilgai antelope has been listed in the 'Low Risk' category by the IUCN. The estimated *population of Nilgai in India is approximately 100,000.* It is enlisted in schedule III of wildlife protection Act 1972. The main threat to the Nilgai is from the destruction of its habitat to accommodate the everswelling human population. In India, it is believed that the Nilgai antelope is a sacred animal (precisely a cow) and it is protected against hunting

Problems Caused in Village Habitats by Blue Bull

The Blue bulls cause a lot of destruction in the agricultural lands of the villagers. They usually take shelters in the bushes near the agricultural fields during the day and by dusk; they will start entering into the fields. They either eat or destroy the produce in the farmland. Even though the farmlands are watched over by the farmers or dogs at night, they are usually chased away by 40 to 50 Blue Bulls who come at the same time. Many suffer loss because of the rampage created by the Blue Bulls.

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

STRIPED HYENA

Scientific Name: Hyaena hyaena
Local Name : Lakkar baggha

Habits The hyena is rare in forested districts, abundant in open country, especially were low hills and ravines offer convenient holes and caves for shelter. Many lie hidden by day in high grass, under bushes or in cane fields but the den usually preferred is cave amongst rocks or a hole dug in the side of a hill or ravine. Quite often a hyena enlarges a porcupine's burrow to suit its needs. They come out in quest of food by night, retiring before sunrise. Pairs usually go about together, sometimes a group of 5 to 6 is seen but this is probably a family party. In search of food the hyena tramps many miles. Its 'spoor' is much like a dog's except that the imprint of the forefoot is much larger than that have hind, and that of the main pad is uneven and oval. Animals that have died of disease or those killed by the larger beasts of prey are the usual food of the hyena. Its share is the coarser remain the heavier bones which the others reject. These it breaks and crushes with its powerful jaws and teeth, swallowing and digesting great fragments. Portions of the meal may be carried to the den to be eaten in greater security. Though scavengers by profession, performing useful services as such, hyenas do not feed wholly on carrion, occasionally sheep and goats and quite often stray dogs are carried off by them. Some individuals, developing the cattle-killing habit, become perfect pests on livestock. Larger cattle are seldom attacked. Despite its bulk and power our hyena does not attack big animals, though an individual may be quite prepared, if need be, to appropriate the kills of panthers.

Threats

i. Road accident

ii. Killed by villagers when enters villages for cattle lifting.

iii. Habitat loss

Conservation issue

i. Lifting of cattle by Hyena leads to man-animal conflicts.

ii. Particular attention should be paid to identifying ways to reduce human-carnivore conflict through promotion of methods that ensure adequate numbers of prey persist and/or methods that reduce livestock killing.

iii. Unawareness among the people. Awareness programme to reduce conflict

MONKEY

Scientific Name: Macaca mulatta

Local Name: Hindi – Bandar

Habits

Captive or wild, this is the common monkey of Northern India. Large troops live near or in villages and towns and in groves round taken and temples. In the jungle, they usually keep to the fringes rarely penetrating into the depths, except where driven to seek denser cover. Almost everywhere the Rhesus enjoys freedom from molestation. To raid fields and gardens of a morning or evening is their common and established practice, to which popular and religious sentiment permits little check. Capture and export on a large scale has now abandoned many areas. Like most macaques, the Rhesus feeds mainly on the ground. Some live habitually among rocks and cliffs.

Threats

i. Hunting

ii. Deforestation – affect the food availability and habitat loss .

iii. Forest Fire

Conservation Issue

i. Enters into agricultural fields leading to conflict.

ii. Human interaction to be reduced

iii. Needs to improve habitat.

iv. Awareness generation among public.

INDIAN PORCUPINE

Scientific Name: Hystrix indica
Local Name : Sayal, sahi,

Habits: The Indian Porcupine favours rocky hill-sides. It adapts itself to any type of country, moist or arid, and inhabits both open land and forest. Porcupines come out after dark. They have a keen sense of small and display high intelligence in evading traps. Vegetable of all kinds, grain fruit, and roots are their main food. They can be very destructive in gardens and cultivation, tunnel line under walls and hedges to make an entry. When irritated or alarmed, porcupines erect their spines, grunt and puff, and rattle their hollow tail quills. Their method of attack is peculiar. The animals launches itself backwards enemy, drives its erect quills deep into it with painful, or even fatal, results. It has been reported from canary hill apart from Sanctuary.

The popular belief that porcupine "shoot' their quills can be disregarded. Porcupines were found with young in Madhya Pradesh in March. Both parents usually occupy the burrow with their offspring, which may number 2 to 4. They are born are born with theireyes open and the body covered with short soft spines.

Threat

i. Hunting/Poaching for their quills and food.
ii. Habitat loss

Conservation issue

i. Habitat protection and conservation.
ii. Awareness generation among public.

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

INDIAN WILD BOAR

Scientific Name: Sus scrofa
Local Name : Jangali suar

Habits: Indian Wild boar live in grass or scanty bush jungle, sometime in forest: after the rains, quite commonly in high crops. They are omnivours, living on crops, roots, tubers, insects, snakes, offal, and carrion. They feed in the early morning and late in the evening and, where much disturbed, chiefly at night. These raid the agricultural field and eats crops and tubers. No animal is more destructive to crops and in cultivated areas, it is impossible to make a plea for its protection. Wild boar display great intelligence and few animals show greater courage and determination. The sense of smell is acute, the eyesight and hearing moderate. Wild Boar are highly prolific. It is seen that breed at all seasons. In central India the majority of young are born at two periods, shortly before and shortly after the rains. The period of gestation is said to be four months, four to six young are born at a time. The mother shelters them in a heaped-up mass of grass or branches which she builds before she litters. After breeding the big boars live along or in company withanother of equal size or with one or two sows.

Threat:

i. Hunting for meat, sport or in revenge for crop damage.
ii. Habitat loss.

Conservation issue

i. Habitat loss hence enters into agricultural field.
ii. Increases in population.
iii. Awareness for conservation.

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Project Officer
Magadh OCP

JACKAL

Scientific Name : Canis aureus
Local Name : Siyar

The Jackal's long-down, eerie howling at dusk or just before down is perhaps more familiar to most people. It lives almost in any environment, in humid forest country orin dry open plains or desert. The greater number lives in around town and villages and cultivation, sheltering in holes in the ground, among ruins or in dense grass and scrub. These usually comes out at dusk and retires at dawn. Usually they go about alone or two or more hunt together. They are good scavengers and clears the carcasses. They may hunt poultry and goat. It is some time known to hunt small deer and wounded animals. It has been reported from all the forest division. Apart from this Jackals raid melon patches and sugarcane fields. Also feeds upon fallen fruits of Ber tree. In the study area it was found that these raid the Groundnut andsugarcane agricultural fields. Little is known about its family life, it is so secretive in habits. Life span is about 12 years.

Threat:

i. Road Accident
ii. Habitat loss.

Conservation issue

i. A part from stealing poultry enters into agricultural field hence conflict with the human.
ii. Little information is available on jackal densities, habitat use, and ranging patterns in relation to food availability. Information on dispersal, survival and mortality factors of adults, pups and dispersing individuals is not known.
iii. Awareness generation programme for conservation.

JUNGLE CAT

Scientific Name : Felis chaus
Local Name : Jangli billi,

Habit: Jungle Cats inhabit the driver and more open parts of the country, keeping more to grassland, scrub jungle, the reedy banks of river and marshes. The Jungle Cat is frequently come out by day, more usually in the mornings and evenings. Its movements in the open area much like those of a small panther. It preys on small mammals, birds, and when near villages on poultry. There is record of one making bold to seize its prey even in the presence of the owners. Very swift and exceedingly strong for its size, it is quite capable of bringing down larger game. Births have been recorded between January-April and in August and November. The litter size usually 3 but occasionally up to 5 kittens. The eyes open 11 to 15 days after birth.

Threat:

i. Enter in villages for stealing poultry due to this conflict with the people and gets killed.
ii. Habitat loss and decrease in prey.

Conservation issue :

i. Needs awareness among the people.
ii. Habitat improvement.

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Project Officer
Magadh OCP

SPOTTED DEER

Scientific Name : Axis axis
Local Name : Chital
Habitat: They are commonly seen in herd of 10-30 individuals. They prefer company oflangurs and monkeys. These animals feed upon fruits and shoots of trees fallen on ground after langurs and monkeys have finished their food. They are fond of Mahua flowers and are often seen under Mahua trees. These may enter the cultivations and eats up the crops. They are less nocturnal them Sambhar and feed till late in the morning and in the afternoon. They prefer open and shrubby areas and do require cover also.

Threats
i. Poaching for meat and skin
ii. Habitat loss
iii. Comes out in open during summer near villages for water.

Conservation issue: Since it is killed for meat and its skin and horns is used as trophy. It is important to generate awareness among public for importance of conservation.

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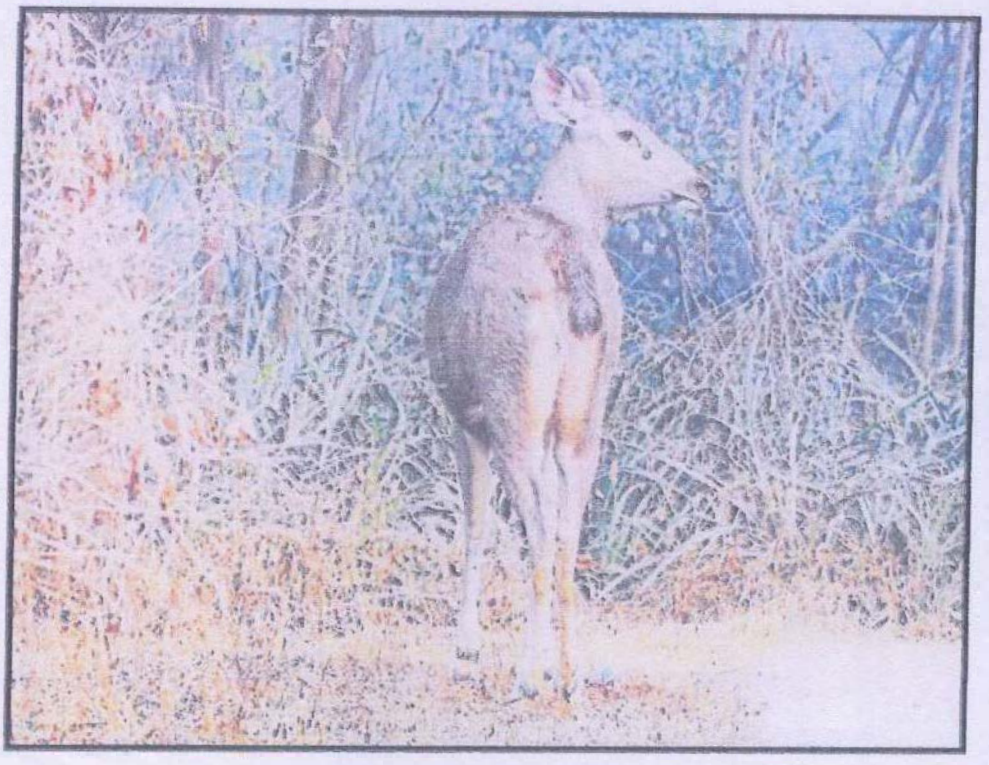
Project Officer
Magadh OCP

SAMBHARS



Sambhar, the largest of deer species in India, which is found all over the P.A. The Sanctuary is suitable for the Sambhar on account of the fact that it's tract, the terrain, the climate and the vegetation make the habitat most suitable for them. The Sambhars mostly browse on the leaves, young shoots, flowers and fruits of the following species, Nyctanthes arbortristis, Bauhinia species, Eugenia dalbergioides, Terminalia species, Zizyphus species, Leaves of bamboo, Tender leaves of sal.

They have been rarely found grazing on grass. The food for sambhars is usually available throughout the year, though the intense heat and incidences of fire make them strive hard for food during peak of summer.

Threats

i. Poaching for meat and skin
ii. Habitat loss.

Conservation issue

Since it is killed for meat and its skin and horns is used as trophy. It is important to generate awareness among public for importance of conservation.

COMMON MANGOOSE

Scientific Name : Hrpestes edwardsi
Local Name : Newala

Habitat: They are not creature of forests but of open lands, of scrubs jungle and cultivations near the villages. These prey upon rats, snakes, lizards, frogs, Tharns and insects etc. It digs in moist soil for earthworm and eat eggs of ground nesting birds. It also eats fruits, roots and carrion. It breeds all the years and three litters may beproduced in a year.

Threats
i. Hunted for keeping pet.

Conservation issue
i. Habitat management

REPTILES

A typical reptile is lizard-like in shape, with three main parts the head, trunk and the tailconstituting the body. Reptiles are the first vertebrates to break their link with water andbecome truly adapted to terrestrial life. All reptiles are covered by dry scales or horny plates. All are cold blooded animals i.e. their body temperature is not constant and varies with the surroundings. Most reptiles, barring the burrowing snakes and some degenerate lizard, have fairly well developed eyesight. A vast majority of the reptiles are carnivorous, insects constituting the principal food. Sexes are separate but are not easily distinguishable. Most reptiles lay hard-shelled eggs which are usually buried in pits in the soil for incubation but a few produce live young. Parental care among

reptiles is negligible.

The beneficial role played by reptiles is little known. Lizards destroy countless harmful insects. Snakes are efficient destroyers of rats which damage our food crops. It is suggested that snakes can even be utilized as indicators of levels of pollution. Snakes are used in basic research because they spend their lives in slow motion capable of subsisting on a fraction of food input. Apart from providing antivenin - the life saving antidote for snakebite, the venom of snake is put to other uses. Cobra venom is said to be an effective pain killer while that of the Russell's viper can prevent excess bleeding during the dental surgery.

The *poisonous snakes found* in the study area were Spectacled Cobra, Banded Krait, Common Krait, Russell's Viper, Green Pit-viper. The common non – poisonous snakes are India Rock Python, Rat Snake, Checkered Keelback and Buff-stripped Keelback. Among Lizards, Monitor Lizard, Indian house gecko, Rock lizard, Common Garden Lizard and Skink are found. Indian Rock Python (Python morulus) belong to Schedule-I species and Common Indian Monitor Lizard belong to Schedule-II.

PYTHON

Scientific Name : Python molurus
Local Name : Ajgar

Habit: The Indian Rock Python is a serpent of marshes, and wet rocky areas near streams and pools. It is a resident of burrows, dense clumps of vegetation, large rotten logs, caves, crevices and old ruins namely, structures and monuments. It is a good clumber and sometime suspends itself from the branches of trees, waiting motionless for a prey to come within its easy reach. It is extremely fond of

water and is an expert swimmer.

Like all other species of reptiles it is cold blooded by nature and as such it hibernates into hollows of trees, underneath rocks or rock-shelves. The species is more nocturnal than diurnal.

Food: Its dietary habits are largely restricted to reptiles (monitor lizard), birds (peafowl, poultry, wild ducks) and mammals (hare, porcupine, langur, jackal, mouse deer, hog deer, chital etc.) but seem to prefer mammals.

COMMON INDIAN MONITOR

Scientific Name : Varanus bengalensis
Local Name : Goha

Common Indian Monitor lizard famous in Indian history for its reported use by Maratha heroes in scaling the walls of Mughal fortresses. Monitors are distinguished by their long and flattened body, long tail, long neck and the extremely elongated, slender, forked tongue, similar to that of snakes. Eyes with well-developed eyelids. Head covered with small scales. Body covered with small round or oval scales. Ventral scales arranged in regular rows. Limbs well developed and the digits armed with strong claws. Inhabits a variety of habitats from semi-deserts and scrub to evergreen forests and plantations. Diet consists of a variety of insects and spiders, snails, crabs, frogs, small mammals, birds.

Common threat to reptiles:

i. Several species of reptiles are killed for their valuable skin for commercial use.

ii. A number of species of reptiles are, however, critically endangered now due to thegradual loss of their habitat and overexploitation by man for food, medicine and skin.

iii. Fear from death due to snake bites make them vulnerable to human kill.

Conservation issues

In general the reptilian fauna of India is on decline due to various factors including environment apathy, habitat loss, forest fire and ignorance of the common people towards them and their over exploitation for commercial uses; besides, non- implementation of the conservation measure is also important. Snakes don't get much legal protection because of the public prejudice.

Birds

Birds are amongst the most eye-catching forms of animal life. These are bipedal egg laying vertebrates in which the forelimbs have modified into wings. There are about 10,000 living bird species in the world. Birds are one of the best indicators of environmental quality of any ecosystem (Ripley, 1978). Of the total number of different species of birds known to inhabit earth, about one tenth is found in India alone. The avifauna of India includes around 1313 species (Grimmett et al., 2011). .

The site specific survey reveals presence of at least 119 species of birds belonged to 47 families. Indian Peafowl (Pavo cristatus), Critically endangered White-backed Vulture (Gyps bengalensis), Indian Vulture (Gyps indicus) is enlisted in Schedule-I of wildlife (Protection) Act, 1972. Among observed several, notable species observed are the WhiteBacked Vulture and Lomg-Billed Vulture. Himalayan Grifon(Gyps Himalayensis) is reported to be a winter visitor and Egyptian Vulture (Neophron percnopterus) is known to be rare.

Many endangered species of birds are documented from this district.The district Chatra has a undivisible and unique relation with forest. Therefore, literally as well as symbolically, Chatra is associated with forests. In ancient period, the area covered by the present district and adjoining areas were ruled by a number of states, which were collectively known as the *Atavika* (forest) states..Nature wears her best clothes in this district. This district is endowed with abundant flora and fauna wealth. Many water bodies and rivers like Baksha Dam,Laxmanpur Dam,Dahuri Dam,Dhulki Dam,Hiru Dam,Leelajan river,Amanat river and Mahane river..Chatra district is also blessed with many forests like Lawalaung Wildlife Sanctuary,adjoining areas of Gautam Buddha and Hazaribagh wildlife sanctuary,The hills distributed from Chatra to Palamau,Kauleshwari hill the forest of Piri,Kunda and Pratappur etc.

Name-The lesser adjutant (Garuda) **Food**-Water Weeds, fishes, reptiles, frogs, rodents etc. **Conservational Status**-Threatened (Vulnerable) **Residential Status**-*Local*

Name-Red naped Ibis **Food**-Beatles, insects, frogs, and other small vertebrates as wel. as grain. **Conservational status**-Least Concern **Residential Status**-Local

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Name-Asian Openbill **Food-** Predominantly on molluscs,fishes **Conservational Status-**Least concern **Residential status-**Local

Name-White Barn owl **Food-**small prey items **Conservational status-**Least Concern **Residential status-**Local

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Project Officer
Magadh OCP

Name-Kingfisher **Food**-Fishes **Conservational status**-Least Concern **Residential status**-Local

Name-White stork **Food**- insects, fish, amphibians, reptiles, small mammals etc. **Conservational Status**- Least Concern **Residential status**-Local

Name-Indian Grey Hornbill **Food**-figs, and seals etc **Conservational Status**-Least Concern **Residential Status**-Local

Name-House Crow **Food**-rubbish, leftovers, debris, and sewage etc.**Conservational Status**-Least Concern **Residential Status**-Local

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Magadh OCP

Name-Indian Bulbul Food- fruits, nectar and insects **Conservational Status**-Least concern **Residential status**-Local

Name-Common Myna **Food**- insects, arachnids, crustaceans, reptiles, small mammals etc **Conservational Status**-Least concern **Residential status**-Local

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Project Officer
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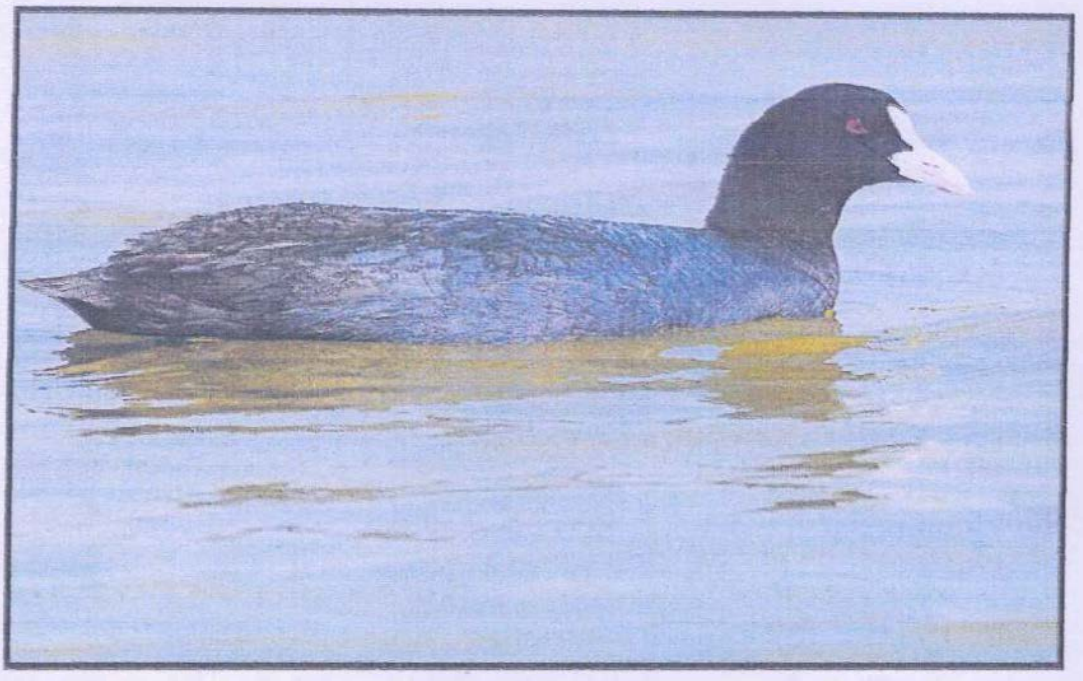

Name-Common Coot **Food**-Water Weeds **Conservational Status-Least Concern Residential Status-Migratory**

Name-Red Wattled Lapwing **Food-** insects, snails and other invertebrates etc. Conservational Status-Least Concern Residential status-Local

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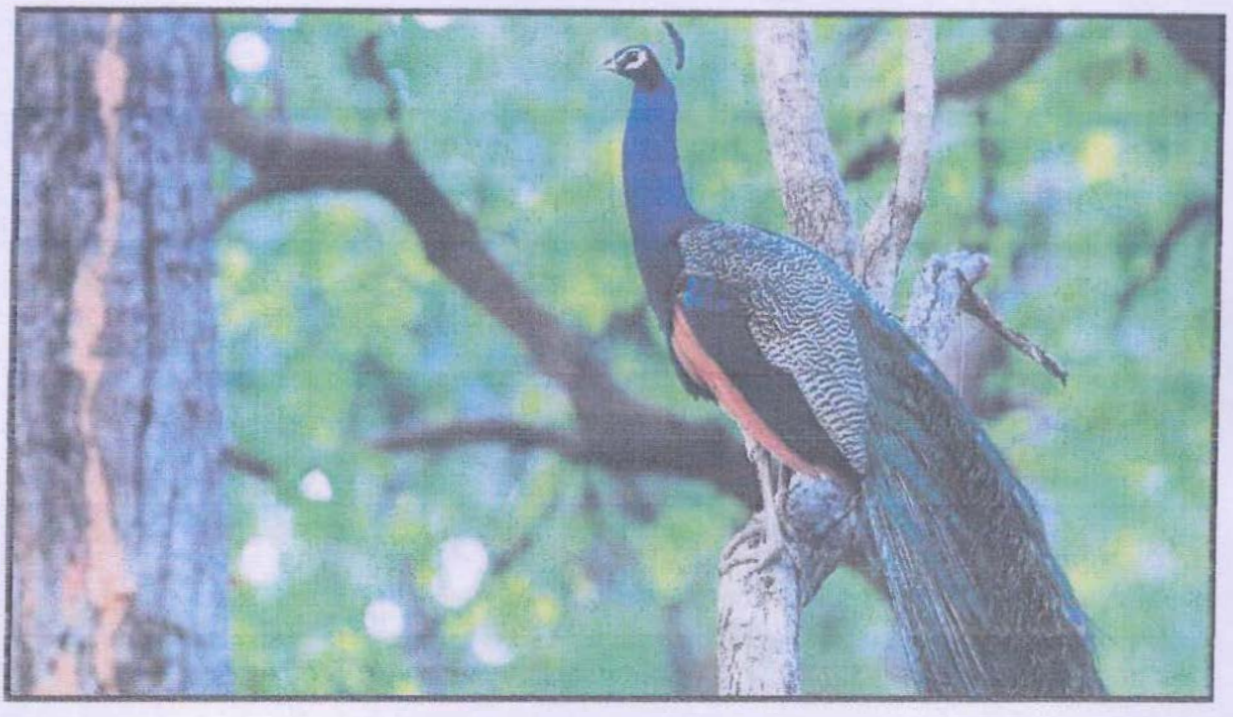
Name-Indian Roller Food-insects,reptiles, birds, and small mammals etc. Conservational status-Least Concern Residential Status-Local



Name-Peacock **Food**-plants, flower petals, seed heads, insects etc. **Conservational status**-Least Concern **Residential Status**-Local

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Name-Sandpiper **Food**-Water Weeds,fishes,insects etc. **Conservational status**-Least Concern **Residential status**-Local

Name-Asian Koel **Food**- fruits, insects, lizards and eggs of birds and other animals **Conservational status**-Least concern Residential status-Local

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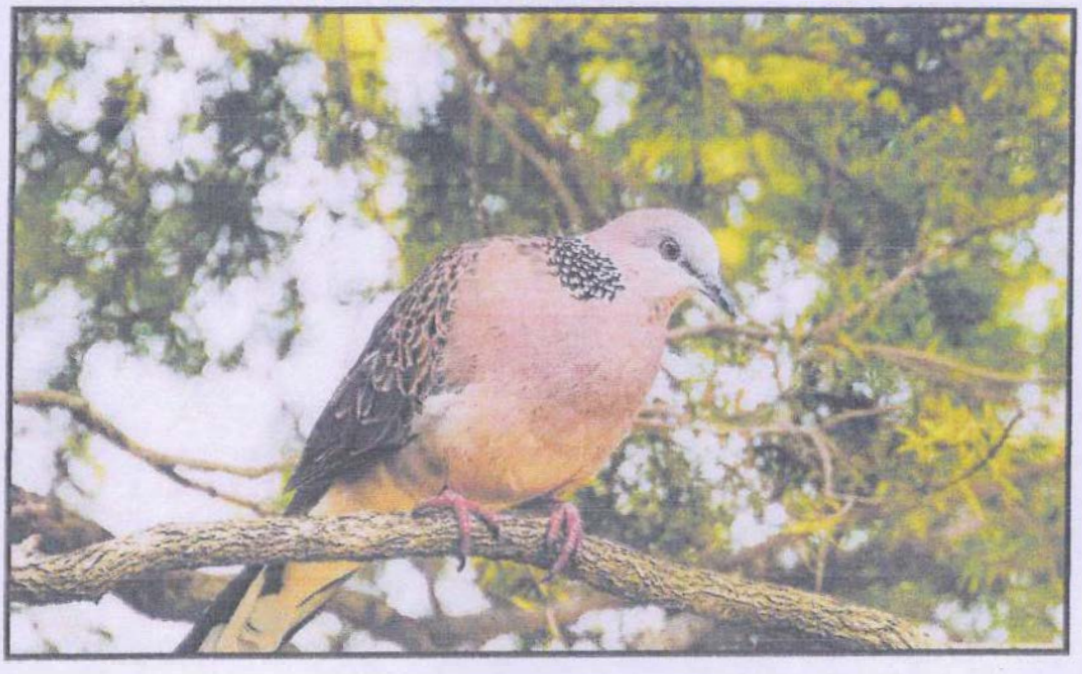
Name- rose-ringed parakeet (ring-necked parakeet) **Food-**buds, fruits, vegetables, nuts, berries, and seeds etc. **Conservational status-**Least Concern Residential status-Local

Name- Indian spotted eagle **Food-** small birds, mammals, reptiles and frogs. **Conservational Status-** Vulnerable(Threatened) **Residential Status-**Local

Name- Rock Pigeon **Food-** plant matter,chiefly fruits and grains. **Conservational Status-** Least Concern **Residential Status-**Local



Name- Spotted dove **Food-** grass seeds, grains, fallen fruits and seeds of other plants **Conservational Status-** Least Concern **Residential Status-**Local

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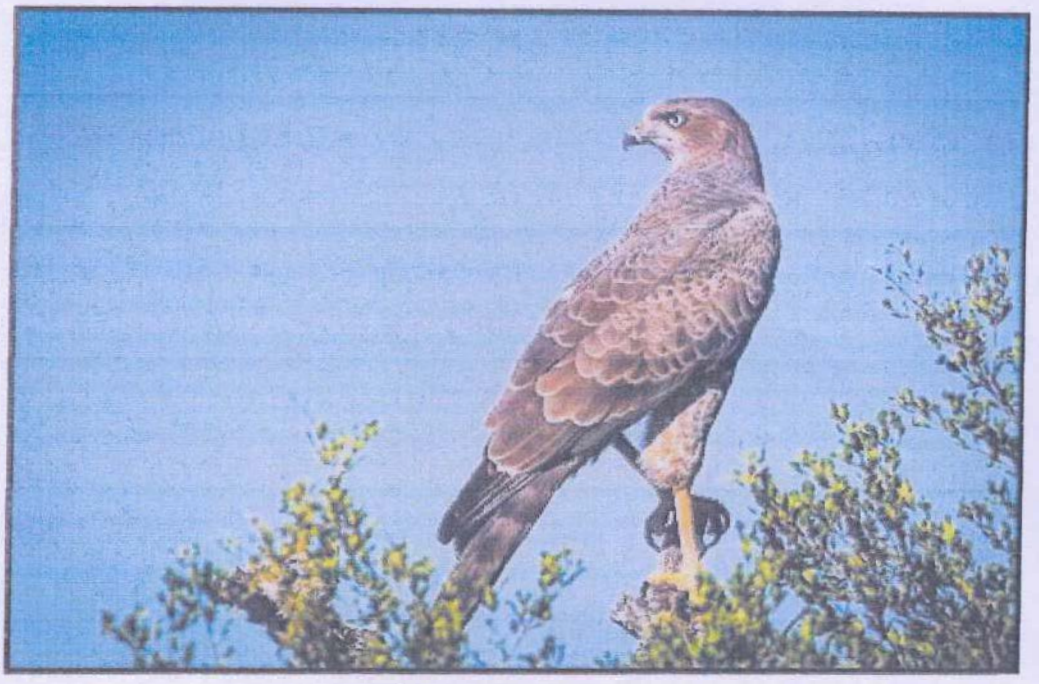

Name- Falcon **Food-** shorebirds, ducks, grebes, gulls, pigeons, and songbirds **Conservational Status**- Least Concern **Residential Status**-Local

Name- Cattle Egret **Food-** Insects, flies, moths etc. **Conservational Status-** Least Concern **Residential Status**-Local

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Name- Black Drongo **Food**-Insects, termites, wasps, bees, ants, moths etc.
Conservational Status-Least Concern **Residential Status**- Local

Name- Jungle babbler **Food**- insects, grains, nectar and berries etc.
Conservational Status- Least Concern **Residential Status**- Local

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Name- Hoopoe **Food-** Insects,small reptiles etc. **Conservational Status-** Least concern **Residential Status-** Local

Name- House Sparrow **Food-** seeds,weeds etc. **Conservational Status-** Least Concern **Residential Status-** Local

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Name- Jungle Fowl **Food**-_ Insects,Plants etc. **Conservational Status**- Least concern **Residential Status**-Local

Name- Grey Francolin(Teetar) **Food**-_ seeds, grains as well as insects, particularly termites and beetles etc. **Conservational Status**- Least concern **Residential Status**- Local

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Project Officer
Magadh OCP

Common threats to the bird

i. Hunting/Poaching
ii. Habitat loss
iii. Pesticides
iv. Use of NSAIDs
v. Electrocution due to mining project

Conservation issue

i. Habitat loss due to anthropogenic activity should be compensated by plantation of food yielding plants and nesting trees.
ii. The habitat of the wetland species of birds (water bodies like pond, lakes etc.) for roosting, nesting and feeding is important. Hence the water management is important survival.
iii. Artificial nest to be installed in villages and trees around the impact zone to compensate the loss of habitat due to ground clearance during operational phase.

Amphibians

Eight species of amphibians were recorded from the quadrates sampled for abundance. It is also possible that a thorough search in the wet areas would have resulted in more species.

Movement of mega fauna in last 3 years

Movement of mega faun which mostly involves movement of elephants have been reported in Gargoma in the year 2016, Matkoma in the year 2016, 2020 and 2021, Nawadih in the year 2015, 2016, 2017, 2018 and 2020,Chumba in the year 2015, 16 and 20. From the data above it can be easily understood that Nawadih has been the most affected village in the area as every year elephant movement has been recorded.

Man-Animal Conflict

As per the information received from the local villagers it has been learnt that most of the conflicts are resultant of crop raiding by Elephant, Nilgai, Wild Boar. Besides few incidences of cattle killing and injuries to human is due to presence of Jackal and Hyena. Apart from this during the village level survey in the sample area and talking to local peoples it was found that most of the conflicts are resultant of crop raiding by Elephant, Blue bull (Nilgai), Wild Boar and conflict was due to Hyena and Jackal.Specially herbivores are found of maize and paddy

crop. Beside this snake bite cases have been reported from almost all the places. A few incidences of cattle killing/lifting due to presence of Hyena, Jackal, was reported during the survey. Such man-animal conflicts should be resolved giving attention towards sensible scientific & compassionateapproach.

Damage during wild life raiding in Tandwa Range over the last 7 Years

Damage during wild life raiding in Tandwa Range over the last 7 Years

Year	Type of Damage	Incidents
2015	Crop damage	70
	House damage	33
2016	Animal damage	2
	Crop Damage	5
	House damage	2
2017	Animal damage	5
	Crop Damage	77
	House damage	24
	Human casualty	1
2018	Animal damage	2
	Crop Damage	63
	House damage	5
	Human casualty	1

Year	Type of Damage	Incidents
2019	Animal damage	2
	Crop Damage	6
	House damage	5
	Human casualty	1
2020	Animal damage	0
	Crop Damage	30
	House damage	5
2021	Animal damage	0
	Crop Damage	105
	House damage	13

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

Chapter-2:

Potential Impacts on Environment And Wild Life

Introduction

The impacts of the project were assessed: to help and determine the acceptability of the project, and to ensure that any residual impacts are properly recognized and addressed by appropriate mitigation measures. The process involved looking at the environmental features, uniqueness, potential vulnerabilities and the nature, location, and duration of mining activities, and project design features in effect throughout operation.

A process of examining all possible interactions between all project components, in all phases (pre-mining, mining, and closure) and the environmental and socioeconomic features in and around the project was then used as a "filter", to sharpen the impact assessment and focus on the critical interactions, and to separate out the less important interactions. Less important interactions are usually the ones that self- correct over time, due to the short-term nature of some interactions and the resilience ofcertain features.

Determining the degree of potential impacts

The degree of impact of the proposed mines is determined by the following factors:

- The degree of disturbance that already exists in the project site;
- The uniqueness of the resources or protected nature of the habitat/forest/landscape;
- The threat of future disturbance or considering how this project will affect land use in the future;
- Duration of the impact or activity. Long term impacts exist as long as the mining is in place.

To be clear on the nature of the impacts, the following definitions of impacts that embody the concept of recovery from impact are used:

A major impact can be considered as follows: (for environmental resources) the project affects an entire population or species in sufficient magnitude to cause a decline in

abundance and/or change in distribution beyond which natural recruitment (reproduction, immigration from unaffected areas) would not return that population or species, or any other populations or species dependent upon it, to its former level within several generations; or (for social values), the project affects a subsistence or commercial resource use, business activity, or social behavior to the degree that the wellbeing of the user or local community is affected over the long term. These kinds of impacts are difficult to mitigate, except by changing location or significantly altering project design.

A moderate impact (less significant) can be considered as follows: (for environmental resources) the project affects a portion of a population or habitat and may bring about a change in abundance and/or distribution over one or more generations, but does not threaten the integrity of that population, or any population dependent upon it; or (for social values), a short term effect upon the social and economic wellbeing of resource users or local communities using the project area may also constitute a moderate impact, but from which recovery is expected within 3-6 months. These kinds of impacts can be mitigated or may be acceptable without mitigation, if recovery can be assured.

A minor impact can be considered as follows: (for environmental resources) the project affects a specific group of localized individuals (plants and animals) within a population or a habitat over a short time period (one generation or less), but does not ultimately affect other trophic levels or the population itself; or (for social values), activities of resource users or local communities in the project area are not affected measurably beyond a minor disturbance of resource use or local activities, from which recovery is relatively quick. Impacts of this nature are often amenable to mitigation, or require no mitigation at all.

Some aspects of the environment that are not expected to be affected by the mining process have been screened out and will not be mentioned further in assessing the impacts of the mining.

Field Rationale

- Production of dust is the only effect on atmosphere
- There are no major industries in any areas to be affected by the project
- Construction will not affect population numbers, location or composition

Basically, a habitat or population that can recover fairly quickly from a project impact is not considered to be significantly impacted. Also, if the habitat or population affected is only a small percentage of the total population or habitat in the immediate area (perhaps 1-2%), and there is continuity of habitat in affected

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areas with adjacent habitat in unaffected areas (providing a refuge for affected species), then the impact can also be considered insignificant, as it would likely not be visible or measureable within the spatial and temporal variability of habitat quality and function, and it would not create a barrier (at this scale) to access to adjacent similar habitat, which can provide a buffer or compensating function. To help assess impact significance, for each project activity, all possible interactions with the environment are considered; this means direct and indirect impacts (the latter requiring other conditions to be in place for an impact to occur), and cumulative impacts (the results of project interactions being added to the possible environmental impacts of other projects and planned development in the area). With regard to socio-economic parameters, if a project activity causes a negative impact in one parameter that can be compensated by an overall positive development impact, then the impact can usually be considered to be acceptable.

Habitat loss and alteration

The area cleared for mining is smaller than, for example, clearing for forestry or rural or urban development. However, the impact of disturbance also extends into the forest. Mining near the streams can alter habitat for a large distance, including changes to erosion, sedimentation and flow, and pollution from runoff mainly in the form of residual muck. To reduce the erosion impact maintaining canopy cover over the surface can help to some extent.

Disturbance effects - the emission of matter and energy

Mining can create disturbance in adjacent areas, including noise, vibration, movement, electromagnetic radiation and pollution. Many animals avoid areas near mining areas, so reducing the amount of suitable habitat. Noise can cause stress and hearing damage, alter behavior and disrupt communication. The penetration of noise is altered topography (e.g., noise travels further on steep slopes). Dense forest vegetation can help to screen particulates from penetrating the forest edge. Heavy metal accumulates along left during the mining phase may enter the food chain via soil invertebrates.

Edge effect

Abrupt margins between relatively natural habitat and clearings cause alterations in microclimate, vegetation structure and floristics, so altering habitat for fauna. Changes include increased wind speed and turbulence, and increased light penetration. This in turn leads to greater soil temperature fluctuations, higher evaporation, and decreased humidity and soil moisture. Higher light levels favor disturbance adapted species, including weeds and woody vines. Winds and vines can cause increased canopy damage and tree death. Forest specialist species

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avoid these areas, and there is a rise in gap and edge specialist birds and other generalist species. Restoration of forest around mine clearings can decrease the extent of microclimate alteration.

Spread of weeds, feral animals and fauna from other habitats

Clearing for mining cites create disturbance that facilitates weed invasion by reducing competition from native species. Pests and exotic fauna are also more able to penetrate forests from cleared areas. Weeds can impair ecosystem function and limit the recruitment of native species. Restoration including weed control can allow the re-establishment of forest vegetation, and the return of forest fauna. Feral species (e.g., wild cats, wild dogs) may use cleared patches for movement and hunting.

Barrier effects

The combination of the impacts of mining means they create barriers for many species. This effect is increased by fences, concrete dividers, and other physical barriers. Complete subdivision of a population can lead to the remaining populations being smaller, less viable, and more vulnerable to local extinction. In the long term inbreeding may also occur. The degree of the barrier effect depends on clearing width, traffic volume and speed, and whether canopy connections exist.

Impact on the soil, vegetation, water regime and air

There will be two kinds of land acquisition. Temporary land requirement will last at the most 18 months for the construction of labour camps, and for storage of construction materials and machinery. Permanent land acquisition is required for clearing the mining areas in the forests.

The project will displace any private fruit trees, standing crops, structures (homesteads/house or living quarters, other physical structure, commercial or industrialstructure, business establishments, and rented or occupied commercial premises) religious, community or cultural sites, or any common property resources. Also, some indigenous people are to be displaced by the project.

Given that the total amount of land required is minimal and that compensation has been already provided, the impact of permanent project land acquisition are deemed to be acceptable which in this case is forest land. The direct impact of project land acquisition (temporary and permanent) requires compensation for loss of land (permanent) and loss of access to land. Compensation (as already worked out) will prevent any additional vulnerability for the affected households

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for private land and for forest land already places and extent of compensatory afforestation has been identified.

Temporary land is required for setting up Contractor facility establishment, storage site and worker camps. The land will not be acquired but shall be taken on lease from the private land owners. It is expected that the Contractor Facility and storage sites will be selected at the last point.

Given the fact that both types of project land acquisition are less than 1% of the map area, and that temporary land acquisition will actually result in rehabilitated and revegetated, the net impacts of temporary and permanent project land acquisition are deemed to be acceptable.

Impacts on air quality

With the current ongoing mining works, it is expected that air quality will be impacted due to cumulative impacts of additional machines and vehicles from project. The only source for air pollution will be from the mining.

Increase in demand for water resources

It is estimated that workers will be deployed at various locations across the mining locations. According to the World Health Organization (WHO), 50 to 100 liters of water per person per day are needed to ensure that most basic needs are met and few health concerns arise.

While the water in the labour camps shall be required throughout the mining period but water tankers will be needed to sprinkle water during day time to reduce the impact of coal particles being air born during the transportation of coal from the mines. About 30 tankers of water shall be used in road sprinkling. About 10000 liters of water will be required per tanker for sprinkling on to the area of mining and road to suppress dust. All water requirements will need to be met from nearby streams, which have been identified in the EMP.

Impact on surface waters

The impact on surface water is directly linked to slope instability and therefore impacts on surface water will also be negligible if mines are located at a safe distance of at least 30 m away from surface water sources. Other impacts on surface water will arise from improper waste disposal and sewerage from the workers camps, improper sourcing of water, washing dishes and clothes or bathing along streams.

Like the risk of slope stability, the net impact on water quality will be small

provided mitigation measures restricts the distance of workers camps away from the rivers and streams, and prohibit and enforce measures to minimize pollution of surface water.

Impacts from improper storage of fuel

Since the material requirements for this project need to be supplied prior to mining period, there is no need for large quantities of fuel as material drop off is limited to this period alone. Thus, there are no risks of improper storage of fuel and spillage resulting in contamination of groundwater and surface water. Vehicles can get the required fuel from the local depot and no fuel is required for the mining work itself.

Impacts from improper closure of project work sites

To ensure that project components will not pose future threat to human health or to the environment, Contractor(s) will be required to ensure proper closure of mining activities.

Potential degradation due to project in quantified terms

The area cleared for mining is smaller than, for example, clearing for forestry or rural or urban development. However, the impact of disturbance also extends into the forest. 226.67 hectares of forest land will be used for the mining. We cannot deny the fact that there shall be temporary disturbances during the active mining phase of the project, the potential degradation can be easily mitigated without any harm to the environment.

Qualitative changes in the forest area

226.67 hectares of forest land shall be diverted for the above mentioned project. To compensate the loss two times area of double degraded forest land shall undergo afforestation with species that shall be appropriate for the area concerned, looking into the fact that species planted shall not be a reason of forest fire which might happen if the length of tree is more and it touches any overhead structure.

Spread of weeds, feral animals and fauna from other habitats

Clearing for land for mines create disturbance that facilitates weed invasion by reducing competition from native species. Pests and exotic fauna are also more able to penetrate forests from cleared areas. Weeds can impair ecosystem function and limit the recruitment of native species. Restoration under mines including weed control can allow the re-establishment of rainforest vegetation,

and the return of rainforest fauna. Feral species may use cleared patches for movement and hunting.

Loss of forest cover and habitat for wildlife

As with other project areas where trees will be cut, the potential loss of bird and wildlife habitats can be countered by habitat enhancement in areas adjacent to the mines, and replanting twice the size of the area cleared through Compensatory Afforestation where suitable local trees are planted in currently degraded areas.

The removal of trees and other vegetation along the mines will also have ecological impacts as it will destroy forest habitat and displace species that are living in these areas. This could affect large and small mammals, birds, reptiles, amphibians, insects and other invertebrates. Some inhabitants will simply move away to other areas, but some could be damaged or killed during the clearing process. The biodiversity survey along the mines indicates that a high level of disturbance already exists in the area, from grazing, lopping of trees, and fodder leaf collection by local communities in the area. While clearing of forest areas can have huge consequences on the species' abundance (wildlife, birds, and insects) and these pressures may be further exacerbated by hunting/poaching by outsiders, the forest cover along the alignment is quite scanty and tree density is not very high.

The net impacts of the Project on forest cover may be low but ecological impacts are more significant. Mitigation measures must compensate not only for loss of trees (and forest cover) but also include measures to collect more information and conduct research on the rarer and near threatened species so that specific conservation measurescan be implemented.

Probable increase in vehicular traffic and its impact

Since the material requirements for this project need to be supplied prior to mining period, there is no need for large quantities of fuel as material drop off is limited to this period alone. Thus, there are no risks of improper storage of fuel and spillage resulting in contamination of groundwater and surface water. Vehicles can get the required fuel from the local depot and no fuel is required for the construction work itself. During the pre-mining and mining phase of the project, vehicles shall be used. Since it is a mining project, which has a impact greater than other projects; the vehicular traffic should be kept minimum and its impact shall be mitigated by measures discussed in the next chapter.

Noise, water, soil and air pollution and its impact on flora and fauna

During the active mining and closure of mines phase, noise and air pollution might occurdue to the movement of vehicles for carrying goods and materials that shall influx during the project, however the impact shall be minimal. It is estimated that many staff will be hired/deputed during the mining and closure stage excluding security. This also includes Contractors and their regular staff plus migrant workers.

Contract workers under an individual contractor will come in two phases; during the preconstruction phase to undertake the land clearing and preparation (relatively small numbers) and during the peak mining phase, for all project components, when numbers may rise to about 300.

Impacts on air quality

With the current ongoing mining works, it is expected that air quality will be impacted due to cumulative impacts of additional machines and vehicles from project. The only source for air pollution from the mining shall be the excavation which shall be carried out during benching and foundation work. However, with only about 9mx9m area to be excavated, the amount of dust generated will be minimal.

Increase in demand for water resources

It is estimated that about 300 workers will be deployed at various locations along the mining areas during the peak of the proposed mining activties of water per person per day are needed to ensure that most basic needs are met and few health concerns arise. Assuming usage of 50 liters of water per day for each worker (as community kitchens and pit latrines are expected to be used), the total water requirement during peak mining period is 15,000 liters per day.

While the water in the labor camps shall be required throughout the peak mining, for mining water shall be used for sprinkling to suppress the dust also. About 300000 liters/day of water shall be used in dust suppression. About 10000 liters of water will be also required for sprinkling on to the area close to habitation to suppress dust.

Risk of slope instability

The concern for slope stability only arises for excavation work carried out at localized sites. The design and planning of the mines requires detailed investigation of the geology to ensure that there are no risks associated with stability of mines.

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Environmental Impacts

Operations and maintenance of the roads will not incur major ecological impacts asthere will mitigation measures taken for every aspects of the impacts. Maintenance works will be very small in scale and infrequent, and involves few changes to the existing situation. The practice of allowing some re-growth of vegetation along the road will also have ecological benefits as it will allow plants and animals to re-colonise. Because the forest canopy is now open in these areas the species will be different from those that were originally present, which may be seen as a further gain as this will increase the diversity of habitats.

Study methodology and observations of the experts

Primary research and secondary research has been conducted with an approach oflongitudinal study for the preparation of the plan.

Primary research: Primary research has been conducted by using quota sampling, the data regarding the plan were inquired through focus group discussion.

Key stakeholders of the village were a part of the discussion, since they help us in understanding the actual scenario of the village in context to animal human conflict overthe years. A triangulation of the data gathered was also performed while interviewing the respective DFOs, respective RFOs, Forest Guards, and JFMPCs. Secondary research: Extensive research on secondary material is conducted. Existing reports, articles, journals has been used for the review of literature.

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

Chapter-3
Management Objective And Mitigation Strategies

Objectives of the wild life management

This chapter discusses the mitigation and management plan for the impacts associated with the mines and the required management plans. Specific details associated with each proposed mitigation measure, including the institutional and financial requirements to ensure proper implementation, accountability and monitoringis also detailed out. The identification of impacts covers both the immediate project areaas well as adjoining areas within 5 km in the immediate vicinity of the Project.

Management plan for loss of private land and livelihood

Since all designated forest is owned by the state there is no need to purchase land for themine where it will be done in the forest.

Land compensation is guided by the "Land Compensation Rates (2013)". The compensation rates also apply for compensating structures and fruit trees. The project has made compensation for private lands as mentioned below in accordance with the law-

(i) Acquisition shall entail fair compensation;

(ii) The compensation can be in cash or land or a combination of both (the land owner shall have the discretion to opt for one or the other);

(iii) All the compensation process should be completed before the actual start of the project on the ground;

(iv) If land is provided as compensation, the certificate for new land shall be made available so that the affected people do not encounter any problems in the future.

If affected households are not satisfied with the proposed compensation, their grievances shall be redressed through so called the "Grievance Redressal Mechanism" tothe Grievance Redressal Committee constituted.

Due to the type of land being acquired as well as the extent of land acquisition, no significant impacts on the income of the displaced households is anticipated as a resultof the acquisition.

Employment opportunities

The project will be able to provide job opportunities to the local people. This shall require several workers and the preference shall be given to those affected by the project. Further, the affected people shall also be provided employment in mining work depending on their skills and qualification. Job opportunities include working for Contractors, transportation of materials, involvement in compensatory forestation programs and land management work initiated by the project.

The project will also bring in new opportunities to sell locally grown vegetables, milk products and meat. Renting of living quarters and office space to project contractors and their employees, leasing of vehicles and equipment to the project contractors, or leasing of private land to project contractors are some other ways for locals to earn increased incomes.

Management of Social Impacts

The project may cause a conglomeration of internal and external labor in the project sites. Workers may come from either the same locality or from other areas. There would be worker camps established. The impacts from these would increase opportunities for employment for the local people which is a positive move but on the negative side the accumulation of waste both liquid and solid, intrusion to the village life etc. should be managed. Waste disposal should be properly organized so that there would not be any littering and pollution of nearby water bodies. All the mining sites, stores of materials, temporary and permanent building, utensils used for cooking etc. should be carefully maintained. All the disposals should be properly supervised.

Management of workers/worker camps

The impacts due to influx of workers will begin from the mining phase and will continue at an expanded scale in the post mining phase. This means more workers at each work location, and more frequent movement of materials and equipment. Proper planning and experience in the mining phase will set the stage for effective planning and mitigation measures in the post mining phase. The main concerns with an influx of workers include:

(i) Risk of communicable diseases spreading in the local community;
(ii) Waste and sewage entering the local environment;
(iii) Safety issues at the work sites.
(iv) Possible social instability;

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(v) Health concerns in the camps (communicable diseases, poor air quality).

(vi) Risk of communicable diseases spreading in the local community

To avoid or at least to minimize the spread of communicable diseases to the localcommunity, the following management measures shall be taken up:

(i) Screening and regular unannounced checking of workers. As per the procedure for hiring workers, all contractors and labor agencies are required to make all prospective workers undergo medical tests to screen for diseases and sicknesses, prior to selection and employment of any foreign worker. The contractor is also responsible for ensuring that no foreign worker who has a criminal record is employed at the project site.

(ii) Checking of workers. In addition to this, the Project Management will also undertake sudden, unannounced checks on workers to look for diseases such as HIV, STDs, and hepatitis. If such cases are detected, the contractor will be required to immediately release the worker from the site (as this indicates that proper screening was not conducted).

Ensure Minimal Land clearing and Removal of Vegetation for housing

The project will ensure that wherever possible no land conversion will be required for additional housing. This can be done through worker camp selection in already degraded/semi cleared forests in discussion with the authorities.

Housing and sanitation for workers

a) The main mitigation approach is proper siting and design of the temporary worker camps, and to get these built quickly (accommodating at least 50 workers at a site). The relative isolation of the worker camps (quite far away from local communities) will help to minimize an overloading of worker-local community interactions, which should help reduce social and cultural conflicts, as well as the risk of spread of communicable diseases.

b) Prior to beginning the mining works, the general layout of the labour camps at each mining site should be designed to plan for location of important structures like:

(i) Drinking water storage tanks or taps

(ii) Community kitchens

(iii) Pit latrines and soak-away (as far away from watercourses as possible),

(iv) Proper site drainage

(v) A solid waste storage area (for onward transfer to the local landfill).

The use of community kitchen and community toilets will help to reduce both the demand for fuel, water and minimize pollution and allow centralized waste and wastewater management.

Provision of Drinking water

It is estimated that about 300 workers will be deployed at various locations along the mining areas during the peak mining and various mining period. According to the World Health Organization (WHO), 50 to 100 liters of water per person per day are needed to ensure that most basic needs are met and few health concerns arise. Assuming usage of 50 litres of water per day for each worker (as community kitchens and pit latrines are expected to be used), the total water requirement during peak mining period is 15,000 liters per day.

While the water in the labor camps shall be required throughout the mining work water shall be used for sprinkling on the raids for suppressing dust. About 300000 litres/day of water shall be used in sprinkling works.

About 30 tankers of water will also be required for sprinkling on to the area of mining and roads to suppress dust However; this shall be required only during the excavation. All water requirements will need to be met from nearby streams, which have been identified in the EMP.

Strategies for mitigation of impactwater

Drinking water will be sourced and provided for each worker camp. The amount of water available in the project area is sufficient to meet the requirement of the project. Although, it is been estimated as above, the actual quantity of use shall be even lesser due to use of community kitchen and pit latrines. All labor camps shall be located near the streams and water extracted through PVC water pipes. The laborers shall be distributed into 5 gangs at different locations of mines and shall be provided each with a camp, a community kitchen and two pit latrines.

Method of Water Extraction

The water shall be extracted through Gravity-Fed System. The system works on gravity which allows the water stored in the tank to move down by its own

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weight inside the pipes and run out from the taps. The water from the nearest stream shall be tapped into the Header Tank/the collection which shall then be passed into a Rapid sand filter and then into storage tank. The main distribution pipe shall be connected to the storage tank through which water shall be distributed into the secondary distribution pipes into labour camps, kitchen and common tap.

Waste and sewage entering the local environment

The source of the waste will be from the temporary colonies of labour, and mining sites. Waste includes PET bottles, papers, plastics, glass, organics, metal, batteries etc. Improper segregation and dumping of waste will result in negatively impacting the visual aesthetics, pollute nearby streams as well as invite vectors to transmit diseases.

Implementing agencies must ensure that the reduction, reuse, recycling and disposal of non-hazardous waste are addressed in an environmentally sound manner.

The project will implement the following waste management:

(i) Waste Reduction through promoting the use of renewables instead of firewood wherever possible.

(ii) Waste Reuse by promoting the reuse of large plastic containers, jars and bags wherever possible in worker campsites.

(iii) Waste recycling especially organic waste which can be recycled to make compost at asuitable location. Otherwise the organic waste cans also be given to the nearest household to be fed to cattle and pigs.

(iv) Waste segregation for recycling each site (including offices, colonies and worker camps) will be provided with 2 separate bins for degradable and non-biodegradable waste. Only Waste that cannot be reused or recycled will be disposed. This residual solid waste will have to go to a designated landfill site, away from settlements and water sources.

A waste collection protocol will be established for each site so that waste does not pile upand cause problems to the environment or workers. The waste from the labour camps and construction sites shall be brought to the nearest road side from where it shall be collected. Since, the labour camps shall be located away from the highway; the waste generation shall be less mainly the packaged foods and PET bottles. The solid waste shall be generated only from the covers

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of basic grocery items and kitchen waste.

(a) Site drainage and sewage. At each campsite, the pit latrines and sewage shall be located at least 30 m from watercourses. The sewage treatment on-site, and proper management of worker camps should minimize the risk of contamination of surface. Washing of clothes and dishes directly in streams shall be prohibited to prevent pollution in case there are downstream users.

(b) Awareness. The biggest cause of improper waste management is due to lack of awareness on waste and waste management. The Project will conduct awareness meetings and campaigns through posters or talks to make workers aware of the 4R's: Reduce, Reuse and Recycle and Responsibility.

(c) Site inspections. Monitoring of waste management at all sites will include visual inspections of the camps and work sites. This will be conducted by the Environmental officers.

(v) Safety issues at the work sites

Occupational Health and Safety covers all personnel working under the project and will be in line with the General Rules and Regulations on Occupational Health and Safety (OHS) in Construction, Manufacturing and Mining and Service Industries.

The Occupational Health and Safety program will aim to ensure that the workplace is safe and healthy by: addressing the hazards and risks at the workplace; outlining the procedures and responsibilities for preventing, eliminating and minimizing the effects ofthose hazards and risks; identifying the emergency management plans for the workplace or workplaces; and, specifying how consultation, training and information are to be provided to employees at various workplaces.

a) Nomination of a Health and Safety Focal Person: Within each site the Contractor must nominate a Health and Safety Focal Person who will function as the focal person/representative for all health and safety matters at the workplace, be responsible for maintaining records of all accidents and all health and safety issues at each site, the number of accidents and its cause, actions taken and remedial measures undertaken in case of safety issues. He will be the link between the contractor and all workers and submit grievances of the workers to the contractor and instructions/directives on properhealth care and safety from the contractors back to the workers. He will also ensure that all workers are adequately informed on the requirement to use Personal Protective Equipment and its correct use.

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Project Officer
Magadh OCP

b) Minimizing hazards and risks at the workplace.

To ensure safety at all work sites, the following will be carried out:

(i) Installation of signboards and symbols in risky and hazardous areas, to inform workers to be careful;

(ii) Ensuring that materials are all stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling, or collapse;

(iii) Removing all scrap and waste material from the immediate work area as the work progresses. All excavated earth must be stockpiled at least 2 feet from the pit to avoid material such as loose rocks from falling back into the excavated area and injuring thoseworking inside excavated sites;

(iv) Where scaffolds are required, ensuring that each scaffold or its components shall be capable of supporting its own weight and at least 4 times the maximum intended load applied or transmitted to it. The platform/scaffold plank shall be at least 15 inches (46cm) wide and 1.5 inches thick. The rope should be capable of supporting at least 6 times the maximum intended load applied or transmitted to that rope. Pole scaffolds over 60 feet (5.6m) in height shall be designed by a registered professional engineer and shall be constructed and loaded in accordance with that design

(v) Use only trained staff to construct, install and repair all electrical equipment toprevent risks of electrical shocks and electrocution;

(vi) Install fire extinguishers and/or other fire-fighting equipment at every work site to prepare for any accidental fire hazards.

c) Provision of Personal Protective Equipment

Risks to the health and safety of workers can be prevented by provision of Personal Protective Equipment (PPEs) to all workers. Personal protective equipment like safety gloves, helmet, mufflers etc. will be provided during the mining period and during the maintenance work. This will be included in the construction cost for each Contractor. Depending on the nature of work and the risks involved, contractors must provide without any cost to the workers, the following protective equipment:

(i) Helmet shall be provided to all workers, or visitors visiting the site, for protection ofthe head against impact or penetration of falling or flying objects.

(ii) Safety belt shall be provided to workers working at heights (more than 20 ft) such asstringing and conductor installation;

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(iii) Safety boots shall be provided to all workers for protection of feet from impact orpenetration of falling objects on feet;

(iv) Ear protecting devices shall be provided to all workers and will be used during theoccurrence of extensive noise.

(v) Eye and face protection equipment shall be provided to all welders to protect against sparks;

(vi) Respiratory protection devices shall be provided to all workers during occurrence of fumes, dusts, or toxic gas/vapor;

(vii) Safety nets shall be provided when workplaces are more than 25 feet (7.5 m) above the ground or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors or safety belts is impractical;

(viii) First aid facilities will be made available with the labor gangs and doctors called in from nearby towns when necessary.

ix) The safety and emergency procedures manual will be kept. Necessary training regarding the safety aspects of the personnel working at the project site will be provided.

d) Record maintenance and remedial action

The Project Management will maintain a record of all accidents and injuries that occurat the work site. This work will be delegated by the contractor to the site supervisor and regularly reviewed every quarter by project management. Reports prepared by the contractor shall include information on the place, date and time of the incident, name ofpersons involved, cause of incident, witnesses present and their statements. Based on such reports, the management can jointly identify any unsafe conditions, acts or procedures and recommend for the contractor to undertake certain mitigative actions tochange any unsafe or harmful conditions.

e) Compensation for Injuries and Death

Any casualty or injury resulting from occupational activities should be compensated as per the applicable law. Where compensation is sought by the injured party, proper procedures for documentation of the case will be followed, including a detailed report on the accident, written reports from witnesses, report of the examining doctor and his/her recommendation for treatment. Each individual contractor will be responsible for ensuring compensation for the respective workers.

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(vii) Possible social instability

Another concern with an influx of workers includes possible social instability (poor mingling of workers from outside the district, with local communities, although locals have increasing experience with worker influxes and seem to handle them with equanimity. There is also the risk of spreading communicable diseases to host communities.

Although the number of foreign workers for the mine shall not be huge, the following management measures shall be taken up to eliminate or at least to minimize the impactsof worker influx to social instability:

a) Awareness of the Code of Conduct for workers

The Project management will undertake awareness programs through posters, talks, and meetings with the contractors to clarify the rights and responsibilities of the workers regarding interactions with local people (including communicable disease risks,such as CORONA/HIV/AIDS), work site health and safety, and to make workers aware of procedures to be followed in case of emergencies such as informing the focal health person who in turn will arrange the necessary emergency transportation or treatment.

The Contractor will be required to instruct the site supervisor on the code of conductand ethics for foreign workers. All workers are required to respect the values, traditions, culture and law of the country and respect all regulations and rules. No worker will be allowed to enter areas restricted for foreigners without specific permits.

Management of health concerns in the camps

All workers living in temporary camps will also face health concerns in the camps suchas risk of communicable diseases and poor air quality. The provision of community kitchens will ensure that workers do not have to be exposed to emissions from individual kitchen. To address health concerns of workers, the contractor must institutionalize procedures to deal with emergencies such as sudden illness or accidents.

First aid kits must be made available at all times throughout the entire mining operations period. This is very important, because all work sites are quite far from the nearest BasicHealth Unit. In addition to the first aid kits, the following measures should be in place:

(i) Provisions of a vehicle on standby from the Project Office/Contractor, or provisionsto hire vehicles during emergencies to take the severely injured/sick workers to the nearest Hospital for immediate medical attention;

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(ii) Communication arrangements, such a provision of radios or mobile communication for all work sites, for efficient handling of emergencies, will be made;

(iii) The designated focal health persons' contact number will be posted at the work site for speedy delivery of emergency services. The focal person should know what medical facilities are available at the Hospital.

Management of impacts on cultural and religious sites

It is expected that there will be no impact on Cultural and Religious sites because during design stage extra care was taken to ensure that religious structures/ public property were avoided. However for extra precaution, efforts should still be made toreduce the level of disruption where possible. To achieve this, the CCL shall:

i) Determine the location of all sites that are of local social or cultural importance (temples, shrines, meeting places, etc should not be disturbed.

ii) Consult all affected communities in advance to inform them of the purpose, nature, duration, extent and timing of all work in and around their village, and explain to them the purpose of the Project and its activities along with the workplan and schedule of activities;

iii) Consult the custodians of all social and cultural facilities on the proposed alignment and plan the work to avoid sensitive times (such as key dates in the religious calendar, festivals etc);

iv) No disturbance near the cultural heritage sites.

Air Quality Management

The following measures shall be taken up to mitigate the impacts on air quality during mining phase:

(i)The fugitive dust generation at each excavation sites shall be suppressed by sprinklingwater periodically.

(ii) Those trucks carrying coal shall be covered while transporting. This shall help prevent the dust particles being blown away by the wind;

(iii) Risks to the health and safety of workers can be prevented by provision of PPEs to all workers;

(iv) Leave a covering of grass and/or other naturally occurring low-growing vegetationwhere possible along the mines to reduce dust;

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(v) Avoid burning waste vegetation and instead leave this material in situ after cutting, to rot down gradually, and discourage re-growth whilst it is decomposing;

(vi) An Ambient Air Monitoring Program to monitor Air quality and noise levels will be implemented as part of the overall plan.

Management of Noise generation

To minimize disturbance to the community and the potential increase in ambient noise levels, the Contractor shall be mandated to meet the noise level standard prescribed by National Environment Commission. The impact of noise level on the community shall not be adverse in the case of mines as the project site is located way away from the villages and settlements. Moreover, the forest belt itself shall serve as a buffer and attenuate the noise level.

The workers shall be mandated to wear PPE including ear muff during work at site to prevent occupational diseases. Further, the standard noise exposure limit.

Management of Aesthetics

Visual impacts are generally considered significant where they affect large numbers of people and tourists. The main negative impact on visual aesthetics in the project area will occur during mining, as a result of clearing and site preparation works. This will stop when the mining is completed. The visual impacts here will notbe significant because the mining will be aligned adjacent to the already existing mines. Also, at some locations, the forest itself will provide a good natural screen to hide the mine from the highway.

During mining, dumping of excavated material down the hill may impact the aesthetics of the area. Therefore, management of waste shall be carried out appropriately as explained under soil conservation and management Plan.

Occupational Health and Safety

The Occupational Health and Safety program will aim to ensure that the workplace is safe and healthy by: addressing the hazards and risks at the workplace; outlining the procedures and responsibilities for preventing, eliminating and minimizing the effects ofthose hazards and risks; identifying the emergency management plans for the workplace or workplaces; and, specifying how consultation, training and information are to be provided to employees at various workplaces. The mitigation measures detailed earlier will be followed to minimize hazards and risks at the workplace and ensure the health and safety of workers. The contractor shall be mandated to abide by the

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Occupational Health and Safety Rules, Regulation on Occupational Health Safety and Welfare and Occupational Health and Safety for Construction Industry.

The contractor shall:

(i) Ensure health and safety of all employees and any person at the workplace;

(ii) Improve working condition that are hazardous to health and safety;

(iii) Provide and maintain PPE in good condition and ensure they are used by the employees

(iv) Provide to the employee the information, instruction and supervision.

(v) Forest Conservation

Compensatory Afforestation

The loss of trees will be addressed according to the current guidelines in Jharkhand, with compensatory planting of trees in an area that is twice the size of the area cleared, allowing for up to 40% damage or mortality.

To undertake Compensatory Afforestation the project shall develop mutually agreeable proposal covering project activities for financing and execution. The Chatra Territorial Divisions will be implementing the programme.

The project will focus on deforested areas in and around the project site, but it will not be restricted to project areas if enough sites are not available; it will extend to other degraded areas, landslide prone areas, or areas where the muck excavated is disposed and terraced.

The compensatory afforestation shall be carried out as an integrated afforestation program which would include soil conservation, fencing, protection, awareness, monitoring and evaluation along with maintenance for at least five years period. A properly planted tree or shrub is more tolerant to adverse condition and requires much less management than the one planted incorrectly. Successful tree growth involves proper planning, proper site preparation, selection of plant species, plantation methodology and plantation maintenance.

The best time for plantation would be early spring or autumn during which weather conditions are cool and allow plants to establish roots in the new location.

During the monsoon, the sapling shall be exposed to stress from hot weather and extreme rain soon after their plantation when the saplings are in their

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juvenile stage and during winter extreme cold will stress the seedling. Hand planting shall be adopted for planting saplings. Holes will be dug large enough (not to shallow and not to deep) with the shovel or hoes, for accommodation of root system, will be backfilled by the soil and compost, if required, and watered.

The saplings shall be planted as soon as possible after receiving from nursery to avoid reduced survival rate. Should the plantation be done later, the stocks shall be stored in cool, dark places to minimize loss of root moisture.

Organic mulching shall be done which helps not only to control weed but also helps retain moisture around the plant and provide nutrient as they decay. However, care shall be taken that the mulches are few centimeters away from the tree trunk to avoid trunk rotting.

Biodiversity Conservation

It is expected that no significant irreversible change in local biodiversity will occur as a result of the project. No specific unique wildlife habitats will be affected by the project,as the mining will not create any large barriers to wildlife and bird movements. While the mining does not involve any significant wildlife habitat and is not expected to cause any net loss of species. Any disruption of wildlife behavior will be temporary, and animals (including birds) will be able to move around or over mining sites. Still there is always the risk that avifauna vulnerable or endangered species may be affected due to reduction in habitat size, disturbance in their daily movements, and will be at risk from poaching.

However, the following measures aim to minimize project impacts on rare, endangered or threatened species (if any) and for overall habitat management:

a. Ensure Minimal Land clearing and Removal of Vegetation by working closely withthe Department of Forest to ensure that that there is no rampant clearing or felling of forest in and around work sites. Also, only those trees identified and marked by the Department of Forest will be felled and removed from the site;

b. Provide funds to the Department of Forest to conduct repeated surveys in the forest areas to determine the distribution and population of Rarer and Endangered Bird Species (to be prioritized by Forestry Office), and to conduct ecological studies to determine the precise habitat requirements, feeding, breeding and impacts on species distribution from habitat fragmentation;

c. Seek the assistance of the Chatra Forest Division, Jharkhand Biodiversity Board, to conduct Biodiversity surveys in and around the project site and

create permanent Monitoring Plots to look at the trend in Fauna and Avifauna and the change in use of habitat;

d. As much as possible, large trees on the edge of the right-of-way should not be disturbed or damaged, as these are favoured habitat of the birds. As with other project areas where trees will be cut, the potential loss of bird and wildlife habitats can be countered by planting suitable trees at other locations which are currently degraded (habitat enhancement in those areas).

e. Allow the vegetation along the alignment to grow back to at least 2 meters height, which will provide cover for most wildlife that need to move through the right-of-way;

f. Collaborate with Jharkhand Wildlife and biodiversity Conservation Programs.

Mitigation and management of clearing impacts for forest fauna

Reducing habitat loss – Natural forest avoidance and rehabilitation of unused clearings

Avoiding sensitive habitat or not mining is often an impractical mitigation technique as human population have increased the need for transport, energy and other infrastructure. Rehabilitation of cleared patches is relatively easy to colonies as these are smooth surfaces without much of the hard surface as compared with the roads and other linear projects where surface becomes hard due to movement of the heavy vehicles and machineries.

Maintaining canopy connectivity

Retention of tree canopy is thought to ameliorate many impacts of clearings. This includes reducing changes in microclimate, vegetation structure and composition, and fauna composition. It is also thought that this reduces the barrier effect for many species. Erosion, weed invasion, and feral species are also reduced in the process. Economic gains are expected from reduced maintenance, and also reduced pollutants due to lack of any human activity post mining activities. Safety issues related to falling branches mean canopy connectivity can be maintained along the mine periphery by the fires fighting squad and quick response team.

Minimizing clearing width or mortality

There is a trade-off between mortality risk and the barrier effect, related to mining. Small widths and minimal clearing maximize remaining habitat and canopy cover, but can also increase mortality. On most low use of the forest patches, minimizing clearing width is thought to provide a net positive impact

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due to increased connectivity, with mortality-risk not expected to be a problem for common species. Areas where this may not be the case mining, where rare or threatened species are involved, or where a lifecycle phase is particularly vulnerable to mortality (e.g. where the cleared patch is attractive for warmth, foraging, breeding or for dispersal or migration).

Many of the Project effects associated with wildlife habitat loss will be minimized through implementation of the Project's reclamation plan. The summary of the reclamation plan mitigation recommendations for wildlife and wildlife habitat reclamation include:

- minimize the overall disturbance footprint through mine planning process to avoid critical breeding habitats, nesting and denning sites, and movement corridors to the extent possible;
- preserve remnant forest patches within the development areas where feasible to provide habitat, habitat connectivity and hide cover for wildlife species;
- remnant patches should protect known essential raptor habitat features by incorporating these habitat features where possible;
- maximize the direct placement of salvaged soil to enhance native plant development;
- retain slash and large woody debris in the salvaged soil to provide micro sites for native plant and hide cover for wildlife;
- establish a variety of vegetation species and communities suitable for wildlife, and encourage structural complexity within the forests;
- encourage understory complexity in reclaimed forests by planting native shrubs
- ensure that core security areas are provided for wildlife;
- provide water management program that ensures the surface water quality is maintained; and
- limit sight lines by maintaining mature forest stands as buffers between cleared patches and reclamation areas.

To support the reclamation plan mitigation measures, the following will be implemented to mitigate potential direct and indirect Project effects on wildlife habitat availability:

- Incorporate the existing disturbances into the development and reclamation plans for the project, and other proposed land use activities

to the best extent possible so that habitat loss, habitat fragmentation, linear disturbance features, and cumulative habitat loss are minimized.

- Pre-disturbance surveys has been conducted in the development area prior to mining activities during Project development to determine the occurrence of important wildlife habitat features such as bird nests, mineral licks, bat habitat, active raptor nest sites, and essential raptor habitat features that could indicate the presence of species at risk.
- Protect all important wildlife habitat features in areas of suitable wildlife habitat (on the edge of the Project footprint boundary) appropriate setback distances (or buffer zones) will be considered.
- Clearing and equipment use/storage/cleaning in undisturbed areas within and adjacent to the Project footprint will be avoided.
- Vegetation adjacent to high-activity corridors (e.g. access roads) will be retained to reduce the extent of noise and visual sensory disturbances to the extent possible.
- Where appropriate, vegetated buffer zones (100 m or minimum of 30 m; pending topography constraints) will be maintained between Project infrastructure and streams to the best extent possible.
- As the presence of artificial lighting can potentially affect bird and bat use of nearby habitats, The utility company has developed a visual impact mitigation plan that reduces stray and non-essential artificial lighting to minimize wildlife effects.

Sensory disturbance from the active site will be further mitigated through the use of mufflers on all internal combustion engines to shield noise generated from equipments during daylight hours.

Habitat Connectivity and Movement Habitat loss and fragmentation reduce habitat connectivity and thereby can affect daily and seasonal movements and dispersal ofwildlife species. Wildlife may move into or through habitats that are physically disturbed but are unlikely to reside there, and they are also prone to sensory disturbances (acoustic or visual). As identified in the Project, the potential barriers to wildlife movement associated with the Project include:

- Loss of vegetation and landscape alteration from mining activties;
- Vehicular traffic activity associated with the access road and other activities;

The reclamation plan outlines mitigation measures that will be implemented during progressive reclamation (i.e. reclamation that will occur over the life of

the operations and into closure) that will minimize the impact of the Project on wildlife movement.

The following general wildlife mitigation measures will be implemented to minimize potential disruption to daily and seasonal wildlife movements:

- Will be strategically placed in locations that will maximize wildlife use (e.g. presence of well used trails, suitable habitats, and terrain features such as valleys and depressions that act as natural crossings);
- additional pre-disturbance surveys have been conducted to identify important wildlife habitats and trails along the access road;
- natural underpasses using topography are preferred; and
- Surface water management ponds and ditches located in undisturbed areas of the Project footprint will be designed to allow wildlife to move around or cross safely.

Measures to control dust and other air emissions (e.g. watering of roads and use of dust suppressants, minimizing engine idling, etc.) within the Project footprint will be implemented to minimize effects on adjacent wildlife habitats while transporting the construction materials and other equipments for mining.

Project-specific mitigations targeted to carnivore species have been incorporated into the reclamation planning. Many of these will also support habitat connectivity for migratory birds, raptors, and species at risk, and include:

- minimize the overall disturbance footprint through the mine planning process;
- preserve remnant forest patches in the development areas to provide essential habitat, habitat connectivity, and hide cover for wildlife species;
- retain slash and large woody debris in the replaced soil landscape;
- plant native shrubs early in the reclamation process to initiate hiding cover;
- establish mixed wood forest stands and high density coniferous tree stands;
- provide understory complexity in the reclaimed forests by planting native shrubs such as alder and willow to provide security cover for the carnivores and their prey;
- maximize the amount of ungulate habitat;
- prior to final reclamation, disrupt disturbances and sight lines by mounding surface soils, piling brush; and

- Limit sight lines by maintaining mature forest stands or by planting high density species with conical crown stands to act as buffers between mines, project disturbance boundaries and the reclaimed mine areas.

Additional mitigations that are specifically targeted to bears and bear habitat will also support other carnivores and migratory birds: Maintain a 100 m undisturbed forested buffer around project area and other corridors;

- leave patches of residual forest within and adjacent to the project footprint; and
- Commence planting areas with plant species favorable to bear forage, and by planting shrub and tree species that provide suitable cover.
- For migratory birds, additional relevant mitigations include:
- retain slash and large woody debris in the salvaged soil to provide microsites for native plant and hide cover and perches for wildlife; and
- Ensure project areas promote the re-establishment of woody species and are on a trajectory for reforestation.

Targeted mitigation measures involving amphibians and amphibian habitat include:

- conduct monitoring to identify other habitable ponds and to identify habitatrequirements and constraints;
- construct trial breeding ponds;
- reclaim upland habitat adjacent to reconstructed breeding ponds; and
- Avoid habitat destruction and alteration outside of the defined Project footprintto the best extent possible.

Mitigation measures specific to bat species include:

- avoid direct and indirect impacts to known, primary maternity roosts should any such roosts be located/identified;
- Where possible, tree clearing will be planned to avoid the May to August bat summer season.

Mortality Risk Wildlife mortality risk may increase as a result of increased traffic, wildlife encountering equipment, or elements of the Project footprint, and wildlife being attracted to Project facilities or humans. Plans are already being implemented to reducethis level of access and with the approval of this Project, the levels will be reduced considerably more. Mitigation measures that will be implemented to reduce wildlife mortality risk include:

- All access to the project area will be controlled, no uncontrolled access

will be permitted. Common operational practices will include:

- Prohibiting hunting, harassment, or feeding of wildlife; and
- Implementing a strictly enforced zero tolerance policy on the use offirearms.

A detailed Waste Management Plan will be developed and implemented prior to mining and operational activities to minimize the attraction of wildlife. The utility company will follow the Best Management Practices for camps, fences, and barriers as described Management Practices for Camps, and ensure all waste is stored in wildlife- proof containers and disposed of properly. Some of the waste management and wild life awareness guidelines that will be implemented include:

- Ensuring food waste, refuse, and other attractants are securely contained in enclosed and approved wild life-proof containers and/or facilities (e.g. hard- sided buildings, fenced compounds, and bear-proof transfer station) prior totransportation to a disposal facility to prevent access by scavenging wild life;
- Providing adequate signage to inform employees of the location and proper use ofwild life proof storage containers/facilities;
- Ensuring waste storage containers/facilities are not filled beyond capacity;
- Ensuring regular inspection and maintenance of waste storage containers/facilities is carried out;
- Ensuring measures contained in the management plan are diligently followed by all employees and contractors;
- All on-site staff will receive wild life awareness Training; and
- Warning signs will be installed to advice staff of locations where problem due to wild life has been reported.

Preliminary Wildlife Monitoring Program: Wildlife monitoring will be used to monitor the effects of the Project on wildlife species at risk or species of management concern during operation of the Project and post-closure. In particular, the effects of the Project on wildlife, including disturbance, mortality, and movement will be monitored. Monitoring will consist of a systematic monitoring program along with incidental observations. The wildlife monitoring program will serve a number of important functions including:

- Verifying impact predictions and monitoring the effectiveness of mitigation measures;

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- Improving the utility company's understanding of the effects of Project operation on wildlife within the surrounding area to enable the implementation of adaptive management practices when required; and
- Ensuring compliance with the terms and conditions of the Operating Approval and Project environmental standards once the Project has been approved.

Important considerations in selecting monitoring procedures include minimizing observer influence and ensuring that monitoring activities do not create added disturbance to sensitive wildlife species. In addition, it is important that monitoring efforts are focused on parameters that are directly related to effects mitigation and that provide opportunities to improve mitigation performance over time. For these reasons, the wildlife monitoring program will initially focus on the following, but will not be limited to:

- Continuing with and expanding the use of wildlife monitoring as a low-disturbance, passive monitoring approach to quantitatively measure changes in use of preferred habitat types by larger species such as mammals and other wild animals.

Monitoring breeding birds, raptors, water birds, bats, and amphibians using sensitive species inventory guidelines and recommendations from recovery strategies as reclamation progresses over the landscape.

Implement a wildlife sighting program for Project personnel and contractors to document wildlife occurrences within the Project footprint during the operations to document wildlife movements. This information can be used for monitoring wildlife use/crossings of access roads to identify major wildlife crossing areas for signage placement, improve employee/contractor wildlife awareness, and assist with monitoring the effectiveness of mitigation measures (i.e. avoiding wildlife- vehicle collisions).

- Construction monitoring to ensure timing windows, setbacks, and other mitigation measures are followed.
- Monitoring wildlife use of Project-related linear features (e.g. railway loop, Road line, pipelines, drainage ditches, and ponds) during operation.
- Monitoring wildlife crossings to determine the efficiency of the structures atmaintaining wildlife movements
- Monitoring the effectiveness of any access control measures (e.g. gates) on roads and other linear features. Monitoring and documenting all human-wildlife interactions that occur within the Project footprint.

Post-closure wildlife monitoring linked with the reclamation monitoring program and any other related environmental monitoring programs, continuing until all permit conditions are satisfied and the AER releases the Project site.

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Project Officer
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Chapter-4

Interventions to be done by Department through DFO

1. Component-A– Increasing the local biodiversity in forest and non forest area

1.1. **Forest Restoration by method of Silviculture and gap filling plantation-** Widespread deforestation and declining condition of the Jharkhand's forests has resulted in environmentally, economically and aesthetically impoverished landscapes. To some extent the effects of deforestation and loss in forest quality have been offset through natural regeneration of forest and the establishment of plantations. However, much of the regenerated forest consists of a few species designed to yield one or two products rather than seeking to produce a broader range of forest goods and services that will also contribute to the well being of local communities.

Conventional approaches to plantation forestry are seldom capable of delivering the multiple values of forests and adequately addressing the needs of all interest groups (e.g. forest-dependent communities and downstream water users). Indeed, such schemes can result in a reduction in the range, quality and volume of forest goods and services, social and economic dislocations and an increased vulnerability to climate change and other natural perturbations. There is an urgent need to both improve the quality of forest restoration and rehabilitation at the site level and to find effective ways to undertake these activities in the context of broader environmental, social and economic needs and interests.

The proposed mitigation plan addresses the challenges related to restoration for delivering goods and services by planting multipurpose trees like Arjun, Asan, Teak and others based on the suitability of the soil and general climatic conditions and availability of local tree species in the forest.

1.2. **Afforestation on degraded land, hill, blank patches:** Deforestation and degradation of forests and protection forests belts contribute to land degradation in many regions of Jharkhand. Over the last decades, land affected by soil erosion increased by about 10000 ha annually. Remaining forests are under high pressure due to dependence of rural communities on firewood for cooking. Rural reliance on firewood is prevalent because many households cannot afford the regular use of gas. This creates blanks in certain pockets. To meet the demand

from community these areas need to be restored and planted with fast growing species.

The project proposes to do afforestaion on these degraded lands and blanks created under the protected forests.

1.3. ***Bamboo plantations:*** Bamboo is known as an ancient grass with woody timber. Bamboo has many uses, mainly in construction (flooring, roofing designing, and scaffolding), furniture, food, biofuel, fabrics, cloth, paper, pulp, charcoal, ornamental garden planting, and environmental characteristics, such as a large carbon sink and good phytoremediation option, improving soil structure and soil erosion. Bamboo has the highest growth rate of all tropical plants. After emerging as a shoot, bamboo can complete the growing process in both diameter and height in 35–40 days. This extraordinary power of growth is due to the bouncy properties of the nodes and the intracellular structures of internodes. For thousands of years, bamboo has been an economic source of livelihood and a natural workshop for the employment of local people.

The project proposes to use bamboo plantation as a cover for reducing the incidence of Man-Animal conflict especially that coming from the elephants. As evident it can generate employment and can also help the poor forest dependent communities in repairing of the roof.

Some facts about the sustainability of bamboo are:

- It requires no pesticides or chemical fertilisers
- It grows rapidly and can be harvested in 3-5 years
- It rarely needs replanting
- It produces more oxygen than trees
- It plays an important role in the balance of oxygen and carbon dioxide in the atmosphere
- It sequesters carbon dioxide and is carbon neutral
- It requires no irrigation
- It is excellent for inhibiting soil erosion
- It grows in a wide range of environments
- Its production into fibres has lower environmental impact than other forms of fibre, especially synthetic ones.

1.4. **Salt licks:** Salt licks are deposit of mineral salts used by animals to supplement their nutrition, ensuring enough minerals in their diets. A wide assortment of animals, primarily herbivores use salt licks to get essential nutrients like calcium magnesium, sodium and zinc. Salt licks are natural mineral which are mineral

outcrops in the soil which are visited by herbivores for soil eating (biting and chewing) or licking (with tongue). They also supplement mineral that are deficient in animal vegetable diets.

Animals regularly visit licks in the ecosystem which are composed of primarily common salt (sodium chloride). It provides sodium, calcium, iron, phosphorus etc. Salt licks occur naturally in certain locations in the forest where mineral salt are found on the ground surface.

1.5. **Wildlife Habitat Improvement (Water Holes):** The influence of wildlife management with the goal of maintaining wildlife population and the entire biodiversity at maximum level and maximum ecosystem utilization depend heavily on the knowledge of mineral elements in the nutrients requirement of animals. Salt licks are deposit of mineral salts used by animals to supplement their nutrition, ensuring enough minerals in their diets.

A wide assortment of animals, primarily herbivores use salt licks to get essential nutrients like calcium magnesium, sodium and zinc. Salt licks are natural mineral which are mineral outcrops in the soil which are visited by herbivores for soil eating (biting and chewing) or licking (with tongue). They also supplement mineral that are deficient in animal vegetable diets.

Waterhole depth and the area of water at the start of the dry season are the main environmental factors influencing waterhole use. The importance of waterholes in supporting wild species especially large grazers is critical for maintaining these forest ecosystems. Artificially enlarging and deepening waterholes, particularly those further from human disturbance, could enhance available habitat for a range of species, including grazers.

1.6. **Provision for water tanker for wildlife and forestry with lifting pump, driver, POL and maintenance:** Despite of all efforts from the department and taking all measures to ensure water availability for the animals sometimes due to deficient rain fall and higher temperature, water becomes scarce and hence provision for water tanker has been made under plan.

1.7. **Conservation Measures for bird species: conservation measure for SCS(species of conservation significance)(woodland, grassland, water and migratory bird):** Many bird species migrate in order to survive. However, migration is a perilous journey and involves a wide range of threats. Only a small number of birds are actually threatened by natural events. Sad but true, human activities are the source for most dangers migrating birds are exposed to. And as diverse as people and their habits in different countries are, so are threats the birds face.

The loss of habitats due to pollution or exploitation caused by encroachment for settlement, agriculture, grazing etc. is the main threat migrating birds face, as they are dependent on finding suitable breeding and wintering grounds as well as stopover sites along their flyways where they can rest and feed. The loss of any of these sites used by the birds during their annual cycle could have a dramatic impact on the birds' chances of survival. Also, high-voltage power lines and wind turbines have a dramatic impact on birds, which are in danger of being killed by electrocution or collision. Poaching remains widely practiced in countries where people are highly dependent on biodiversity for their livelihoods.

1.8. **Contour Cutting + Soil water Conservation @100 man-days per hectare for a total area of 600 ha(@Rs 350 * 100 workers * 600 ha):** The forest area in the command of the mines has been degraded due to various reasons and natural regeneration has been affected due to less water availability and drier soils probably. Making contour trenches will help in arresting the runoff and increasing the soil moisture regime. It will also reduce erosion as it will reduce velocity of the runoff water.

1.9. **Checkdam Pakka *15 in numbers* each costing 15 lakhs:** A check dam is constructed across drainage ditch, or waterway to counteract erosion by reducing water flow velocity. In contrast to big dams, check dams are implemented faster, are cost effective, and are smaller in scope. Because of this, their implementation does not typically displace people and communities nor do they destroy natural resources if designed correctly. Moreover, the dams are simple to construct and do not rely on advanced technologies – thereby they can be applied in rural communities with fewer resources or access to technical expertise. These help in conserving water, improving ground water and also it supports wild life during the summer.

1.10. **Loose boulder check dam in Nallas:** Loose Boulder Structures (LBS) are one of the most important drainage line treatments. As the name suggests, LBS is made up of loosely arranged boulders so as to arrest excess erosion and water loss during the rainy season. LBS acts as a speed-breaker that reduces the speed of the water flow, when it rains heavily. It slows down the water, reduces soil erosion and arrests the loss of fertile soil usually washed away. LBS is built in a gully, stream or nala through which the rainwater flows. Two key prerequisites for building LBS are: easy availability of loose boulders and a gully or nala with a loose bottom, that is not rocky – so that stones could be placed after digging the ground. The slope of the gully is also taken into account.

1.11. **Creation of Ponds 15 in Numbers @6 Lakhs**: Ponds are the hidden gems all kinds of people love to come across. Its ecological benefits may go unnoticed because it is such a small body of water.

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Project Officer
Magadh OCP

Truthfully, ponds do much more for the environment than is immediately apparent. They are crucial to the life they support and, therefore, to the whole ecosystem. Entire systems would be disrupted without them, so their protection and maintenance are vital to preserving their surroundings.

Ponds that thrive with life benefit the local ecosystem. Many of these places have been destroyed, and producing new and healthy ones will encourage biodiversity and bring animals back from endangerment. High numbers of native plants and animals in a flourishing pond show that the local environment is in great condition.

This is vital because it preserves the food chain. The Earth would likely notice significant shifts without any of the animals that typically live in ponds. Harmful species would thrive without their normal predators and could end up in worldwide food supplies.

1.12. **Earthen Check dam 15 in numbers @6 Lakhs:** An earthen check dam is a loose stone and earth structure that serves to retain surface and sub-soil flows of water on gently-sloping land. Earthen check dams also function to prevent soil erosion. They are also known as earthen field bunds. By building bunds along contour lines, water runoff is slowed down, which leads to increased water infiltration and enhanced soil moisture. They are constructed with soil and stones, as the structure are a cheap solution usually created by local farmers. When designing an earthen check dam, run-off pools (or burrow pits) for percolation and ground water recharge are required. Incorporation of spillways for surplus water is an important consideration to prevent the erosion of soil and the structure.

These structures will help in storing water and create additional command for the purpose of irrigation and will also help in reducing the widening of nala or drain on which these have been built.

1.13. **Maintenance and repair of pakka and Earthen Checkdam, LBCD and ponds mentioned above in Sl. No. A.9, A.10, A.11, A.12:** Structures that will be created under the project, will require maintenance and repair over time due to siltation and damage caused due to various factors. For maintaining these structures provisions has been made under the plan so that these structures remain sustainable and in use by communities and wild animals as well, when constructed close to forest.

1.14. **Linear Plantation along Rivers, canals, Roads total plants 20000:** As the state continues to grow so is the total length of roads. New roads are being

SADALA SATYANARAYAN
Project Officer
Magadh OCP

constructed by the central and state government to give pace to the development interventions in the state. To make roads stabilize and reduce erosion, plantation will be done along the roads.

2. Measures for Forest Protection, Anti-depredation and wildlife protection

2.1. **Deployment of 10 Home Guards @ 20000 per months:** Keeping people to guard different places like check nakas, forest exit points and also to keep vigil on the animal movements forest guards will be deployed on these places. These are important because it will help in keeping things in check and will also provide employment to local people.

2.2. **Logistic and deployment cost of Home Guards:** To make the deployment effective logistics like dresses, sticks and torches and other instruments will be needed so that they can perform their duties with responsibility and accountability. The cost for the same will be borne by the project.

2.3. **Cost of mobile set and recharges:** To keep connectivity in place among the people deployed project will provide mobiles with facilities for recharge to be borne by the project. It will help in fast movement of the deployed persons and will also keep department updated about the activities of the persons deployed and villagers also. It will also help in fast communication by the deployed persons with the RFO and DFO for the range and division.

3. Capacity building and procurement of anti- depredation items

3.1. **Provision for Crackers and other items:** Crackers and marshals have been in use by the department and communities to drive away the wild animal once they come close to villages. It keeps the casualties at minimum and helps communities to counter elephant raiding and attack by other animals.

3.2. **Snakes Catching Equipments:** Despite the fact that most of the snakes found in the forest are non poisonous people die due to snake bite from the fear. It will be important to distribute snake catching equipments to the persons having skill to catch snakes. Training to catch snakes will also be important

3.3. **Training to trackers/watchers:** Wild animals generally come out of their safe zone during wee hours to nearby water bodies and fringes of villages in search of food. This makes them susceptible to have confrontation with humans and result in subsequent man-animal conflict. Thus to avoid the conflict, there is provision of Anti- depredation squad to wade out the animals into the forest areas. The trackers will be selected from local villages well conversant with animal

SADALA SATYANARAYAN
Project Officer
Mageshi OCP

behaviours, particularly, elephants. The job of the trackers will be primarily to gather data on number of animals seen, their location, their direction of movement and the quantum and nature of depredation being done..

3.4. **Rewards for information:** Wildlife tourism creates both positive and negative impacts. Economic benefit is the most important of these (Adhikari et al., 2005). Bio-physical impacts are more serious than others such as socio-economic. For example, Green and Higginbottom (2001) stated that some vested interested tourists can be involved in wildlife poaching and the collection of wildlife specimens. Poaching and illegal trade is the most serious threat to the survival of many plant and animal taxa in the world (Manel, Berthier, & Luikart, 2002). Approximately 10–20% of all vertebrate and plant species are at risk of extinction over the next few decades mainly due to poaching (IUCN, 2000). So, it is essential to increase the understanding of the relationship between wildlife tourism and rhinoceros poaching for sustaining both tourism and wild life populations.

There will be provision to reward the informer who provide inputs about poaching, hunting, animal trafficking, tree cutting and other wildlife crimes.

3.5. **Animal Rescue and treatments:** Animal welfare describes how an animal is coping mentally and physically with the conditions in which it lives. The 'five freedoms' principle recognises that achieving good animal welfare relies on providing animals:

Freedom from hunger and thirst, by providing access to fresh water and an appropriate diet;

Freedom from discomfort, by providing appropriate environments in which to live;

Freedom from pain, injury or disease, by prevention and rapid diagnosis and treatment;

Freedom to express natural behaviour, by providing appropriate space, facilities, and social interactions with members of their own species; and

Freedom from fear and distress, through appropriate treatment and surroundings.

Contemporary animal welfare practice has moved beyond only providing the five freedoms and focuses on animals having a Life Worth Living. This encompasses both physical and mental wellbeing, and includes the ability to demonstrate natural species-typical behaviours. Aspects of naturalness encompass natural living. This concept emphasises that animals should be able to lead reasonably natural lives. This includes being able to perform important, normal behaviours (e.g. dust bathing for chickens or grazing for horses) and to have some natural

elements in their environment (e.g. sunlight, fresh air or social contact for herd species). This element relates to the freedom to express normal behaviour, including social interactions with members of their own species . Finally, any use of animals for human benefit should minimise suffering of the animals involved. The Australian Animal Welfare Strategy acknowledges that this includes activities relating to population control, habitat management, humane handling, and when necessary, humane killing.

3.6. **Payment towards cost of establishing wild animal rescue team:** Despite of huge technical advantage and many sophisticated gadgets which help in tracking the wild animals, the rescue of the wild animals are mostly done through the human efforts. The setting up a team which includes a veterinarian, a para vets and other members will help in making animals recover fast under the guidance of a wild life expert and officers from the forest department.

3.7. **Construction of machans along Paddy fields:** Elephant raiding is common during the paddy seasons and construction of machans will help in locating animals fast and taking precautionary measures for protection of crops and human life as well. This will also help in thrashing paddy after harvesting.

4. Fire Prevention and Protection of Habitat

4.1. **Fire line creation for 50 km @ Rs. 30500 per km * 50 km:** This one is taking place in forests, where the latest fire seasons have been raging with unprecedented ferocity, from the Amazon to the Arctic: in April 2020, the number of fire alerts across the globe were up by 13% compared to last year – which was already a record year for fires.1 Persistent hotter and drier weather due to climate change, and other human factors such as land conversion for agriculture and poor forest management are the main drivers behind the increase. Climate change and wildfires mutually reinforce each other, and the fires burning today in many parts of the world are bigger, more intense, and last longer than they used to. If current trends continue, there will be devastating long-term consequences. A greater number of more intense fires will release millions of extra tonnes of carbon, decimate biodiversity, destroy vital ecosystems, impact economies and people, threaten property and livelihoods, and cause severe long-term health problems for millions around the world. It is estimated that humans are responsible for around 75% of all wildfires,2 and much of the increase in fire incidents during 2020 can be directly linked to human actions. This means solutions are in our grasp too. There's no magic bullet that will fix the issue overnight, but there are ways forward if behaviours of the past are changed. Proactivity and commitment must be at the heart of a global

response to fires that needs to play out at local, sub-national, national and regional levels. Preventing fires before they occur is paramount, and far preferable in all respects to only suppressing them when they are burning. Good intentions and commitments need to be followed up by real and effective actions on the ground.

4.2. **Maintainance cost of fire line having 20 mans day per km every year @Rs. 350 per day *20 person* 50 km*10 years:** Firebreaks in a strict sense are linear discontinuities where the vegetation is absent or reduced to a low herbaceous layer. These breaks must be located at forest / urban interfaces or on ridges for a better effectiveness. They are built with the bulldozer or by hand and must have a minimal width of 20 m to allow transport and intervention of fire crews, while ensuring their safety. These discontinuities have nevertheless disadvantages:

They are easily jumped over by a fire. Their width is very insufficient to prevent that a fire does not spot beyond the break.
They require a very regular maintenance at 1- to 4-year intervals to control or even to eliminate the vegetation by hand, bulldozers, or phytocides (herbicides).
They are very sensitive to erosion, especially when slopes are steep because of absence or reduction of vegetation. The maintenance techniques accentuate this.
The absence of wind breaking vegetation increases the fire acceleration by winds.
They have a negative landscape impact.

4.3. **Construction of watch tower cum temporary shalter with solar and water facilities @20.00 Lakhs:** In Jharkhand, there are forest areas that are sensitive to fire in the first degree. As a result of forest fires, which is one of the biggest environmental disasters on forest resources, hectares of forest area is damaged annually. One of the important elements of combating forest fires is early detection. In order to achieve this goal, the correct positioning of fire lookout towers is of great importance. It has been seen that the visibility capacities of existing towers and potential towers can be evaluated effectively by using GIS-based visibility analysis.

4.4. **2 watchers at each tower ie total 2 watchers:** To man the watch towers two watchers will be posted at each of the towers and will keep a vigil on the activities under the view of the area.

4.5. **Forest fire:** Fire is the most potential threat to the flora and fauna of the area. Incidences of fire mayhappen due to various reasons and it cost very heavy for

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the forest and wild life residing in the forest. To protect forest from fires following measures has been proposed –

- **Forest Fire Management Squad:** It requires to be placed an equipped team for controlling and reducing forest fire incidences. Fire tracer will be hired for a period of 5 months from February to June every year by the department as these are the months when forests are more prone to forest fire.

4.6. Forest Fire Fighting Equipment: In order to equip the fire fighting squad itis proposed to provide the following equipments like Fire Blower, bush cutter and fire fighting suit etc

4.6.1. Cost of mobile set: To keep people in touch with each other, who are posted at different locations for different purposes for implementation of the wild life management plan, it is important to equip them with the mobile handset with facility for recharge. Provision has been made for the same.

4.6.2. Cost of fire fighting suit @ Rs 7000 per person (considering life 5 years)

4.6.3. Cost of rented vehicles @50000 per months * 6 months

4.6.4. Purchase of fire blower @ Rs. 60000*10 blowers = Rs. 6.00 Lakhs

4.6.5. Running and maintenance of fire blower and cutting @ Rs. 30000 per blower per year * 10 blower

4.6.6. Purchase of brush cutter @Rs. 30000 * 10

5. Livelihood improvement and capacity building to local people

5.1.1. **Farming of Medicinal Plants, Duckery, fishery, honey bee keeping, mushroom cultivation etc. @ 9 Lakhs for 5 years:** Jharkhand forests are rich in bio diversity with lots of herbs with medicinal value. Some of them can be cultivated and grown commercially for betterment of communities and traditional practitioners as well. Along with it additional nonfarm based livelihood options like duckery, fishery and others will be promoted with proper training and market linkage.

5.1.2. **Distribution of Sal plates making machine and other equipments:** Traditionally women stitch raw sal leaf plates which are less remunerative and take lot of time. This has lesser demand in the market and puts a lot of drudgery on women. To make it more efficient and remunerative sal leaf plate making machines will be installed with the women SHG for creating NTFP based livelihood systems.

5.1.3. **Bamboo craft making:** Bamboo is a versatile input and is used as building material, paper pulp resource, scaffolding, agriculture implements, weaving material, plywood and particle board manufacture, basketry, furniture,

pickled or stewed bamboo shoots, medicines, etc. Resource management and technical improvements can convert this fast-growing grass into a durable raw material for construction purposes and a wide range of semi-industrialized products. New industrial applications and modern construction design have both demonstrated bamboo's huge potential. The combined value of internal and commercial uses of bamboo in the world is about Rs 50,000 crores annually. This is supposed to double by 2015. In India archaic legislation and lack of awareness have inhibited the bamboo based industrialization process. The biggest impediment towards a bamboo based sector from developing has been the irregular and scant supply of bamboo for entrepreneurial use. An efficient regulatory institution is essential for markets to grow in a sustainable manner, especially where environment concerns are coupled with business development. Transaction costs must be minimal, information availability maximal with a clear focus on maintaining the forest cover. Unfortunately, the regulatory structure as regards the bamboo industry has remained caught in the quagmire of archaic forest laws. Therefore, what is definitely needed is the linkages that industrialization of the bamboo sector can provide, given the huge linkages with rural livelihood. However, only when there is a viable entrepreneurial activity of any bamboo based product, will the market tend to provide the supply and demand linkages and it is only then that livelihood benefits will accrue

5.2. Capacity building to local people in fringe villages

5.2.1. **Solar street light @ Rs. 20000 per solar light for 100 lights:** a) Ease in walking during evening hours and rainy days About 96% of the respondents mentioned that they find it easy to walk during evening and night hours in the village street. The ease in walking during evening and night hours is due to better illumination. About 88% of the respondents mention that their movements during evening hours in rainy days have become much easier. This is a great boon for the rainy days. The functional duration of the Solar Street Lights during rainy days were reduced due to reduced sunlight hours. However, the Solar Street Lights functioned for 5-6 hours each day and even more during the rainy season. 5-6 hours are generally enough to cover the waking hours after dusk. b)Reduced elephant, tiger, jackal, fox and snake attacks Almost 94% of the respondents mentioned that elephant attacks have reduced in the villages after installation of Solar Street Lights. The respondents mentioned that nowadays elephants enter the village but passes by the streets without halting in the village. Thus, the damages caused by elephants are negligible now. Similar is the case with tigers, jackals and foxes. Before installation of the Solar Street Lights, the incidences of spotting of these animals were more frequent. However, after installation of the Solar

Street Lights, such incidences of spotting of wild animals have reduced drastically. The incidences of snake bites have reduced in the villages, says about 94% of the respondents. The reason is better illumination in the roads. Prior to installation of Solar Street Lights, the snakes or other reptiles were not visible in the village streets and unknowingly stepping on them would result in reptile attacks. Due to better illumination in the streets, the reptile attacks have reduced in the villages. c) Sense of security felt by females A gender strengthening dimension is observed as an impact of the Solar Street Lights. 90 % of the respondents said that women feel safe to walk during evening and night. Prior to installation of Solar Street Lights, women were hesitant to walk alone in the streets. Now, the women are able to go by themselves to the nearby grocery shops alone after dusk. 86% of the respondents mention that women now walk in the streets without being accompanied by any male member during the evening hours. Solar street lights have helped the young girl students as they now go for their tuition classes in the evening without any fear, alone. d)Reduced theft incidents The theft incidences in both the villages have reduced, says about 90% of the respondents. A direct correlation is difficult to establish between installation of Solar Street Lights and reduced incidences of theft in the villages. e) Enhanced liveliness About 22% of the respondents mentioned that there is no difference felt in the frequency of social gatherings outside household premises after installation of Solar Street Lights. However, 78% of the respondents mentioned that the frequency of informal social gatherings outside the household premises has increased after installation of Solar Street Lights. Informal social gatherings enhance the liveliness of the villages. f) Source of quality illumination during power cuts The Solar Street Lights are now the source of quality illumination in the villages during power cuts in evening hours. Thus, in case of power cuts many times the inhabitants depend on the light received from the Solar Street Lights. The light from the Solar Street Lights also illuminates the premises of the adjacent households. Thus, during power cuts, the families gather outside their houses sometimes to sit under the light. g) Feeling of security for children Three respondents mentioned that they feel safe about their children now. The respondents elaborated that earlier they rarely allowed their kids to play outside during evening hours. However, after installation of Solar Street Lights they allow their kids to play outside during evening hours as there is reduced fear of snake and animal attack

5.2.2. **Providing Grain bins @ Rs. 2000*150 bins:** Providing grain bins will help in preserving food items during elephant raiding. These bins can be of metals or of concrete. These can be very helpful in elephant affected areas.

5.2.3. **Long range rechargable tourch lights @ Rs. 2000*150 torch:** Strong lights keep the wild animal away from human habitations. Long range rechargeable torch lights can help as a cost effective means for keeping the animals away.

5.2.4. **Training and capacity building of JFMC @ Rs. 20.00 Lakhs:** JFMC are vital link between communities and the department. They are crucial for flow of information from villages to the department. Their capacity should be built for taking various precautionary measures and taking initiatives for protection, preservation and propagation of forests.

5.2.5. **Seed money for implementation of micro plan for JFMC @ Rs. 2.00 Lakhs per JFMC for 20 JFMC with focus of flora of medicinal and other ecological importance:** Capacity building lone will not serve the purpose and committees should have some financial resource available with them for taking initiatives. Seed money will help the committees to meet urgent expenses and it can be later on again refund back to the seed fund for keeping it intact and in fact growing.

5.2.6. **Construction of shelter house/barrack:** Deep inside the forest sometimes front line workers need rest during peak of the summer and rainy seasons. There has to be some kind of shelter for the forest staff and trackers in the forest. Provision has been made for construction of the shelter house.

5.2.7. **Water Conservation/drinking water sources with purpose to local villagers:** For villagers the project will construct water sources for drinking. It will also serve the purpose of meeting the water requirement for animals. Thus it will make a good and safe source of drinking water for human and animals in need.

6. Capacity building of forest department for implementing ,monitoring and supervision of plan

6.1. Equipment for Monitering

6.1.1. Cost of Digital cameras and drone: For implementation and monitoring digital camera and drone will be needed. Drones help in keeping track and also take a photo for the threats caused to animals due to habitation and loss of habitations due to clearance.

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6.1.2. Cost of night vision binocular, GPS: Night vision binoculars and GPS will be necessary for tracking animals during night. It will help to warn villagers during night and also help to find the injured animals.

6.1.3. Provision for 6 motorcycle @ Rs. 1.5 lakhs per motorcycle: For fast easy and cost effective movement of the front line workers from forest motorcycles are best. These machines can move on narrow paths and can have access to remote locations. Inured human can also be taken to first aid facilities very fast. For keep these machines run properly a maintenance fund of motorcycles @ Rs. 12000 per year per motorcycle has been proposed. 30 liters of petrol will also be part of the maintenance

6.1.4. Maintainance of motorcycles @ Rs. 12000 per year per motercycle * 6 numbers:

6.1.5. POL for six motercycle @Rs. 100/ liters, 30 liters/month per vehicles

6.1.6. Vehicles for monitoring on rent (with driver, diesel and fuel)for CF and other higher officials: Two vehicles will be hired for monitoring by the officers apart from the DFO of the division. These vehicles will also have provision for drivers and fuels along with maintenance.

6.1.7. Vehicles for implementation on rent (with driver, diesel and fuel) for RFO: At the range office a vehicle will be hired for the movement of the RFO and it will also have provision for diesel and driver along with maintenance.

6.1.8. 4 unskilled JFMC members DFO/RFO for patrolling to augment work force @Rs. 8500 per months: Sometimes due to lack of adequate number of staff with no specific skills needed department suffers a lot and find it hard to respond to calls by villagers during emergency. Hence provision of four unskilled manpower has been made under the plan.

6.1.9. **one multitasking technical staff to support DFO for implementation and monitoring of wildlife Plan @40000 per month:** For implementation of the programme and to support the office of the DFO a mutiskilled person will be needed who can handle the day to day task and support the DFO in executing the devised wild life management plan and keep him updated of any development.

6.2. Check Naka

6.2.1. Check Naka buildings: To keep the check on illegal and unauthorized transportation of materials and goods from the forest, check nakas will be established along with the basic minimum facilities and safety measures for

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the forest people and the members of the JFMPCs. The home guard can also be posted for the purpose of checking the illegal trade.

6.2.2. Solar power: Renewables has been getting attention of late due to various sreasons like decrease in cost, less maintenance, greater acceptability and low recurring costs. It is also a safe source of energy from all perspective.

6.2.3. **CCTV camera for Surveillance:** Installing a CCTV system will help department in instantly deterring criminals and theft. Most intruders look for easy targets where there are no security measures in place. Seeing the familiar look of a CCTV system installed at various sites will discourage them to act as the criminals and intruders will not want to be caught on camera.

6.2.4. Automated road crossing: Automated Road crossings prevent the pedestrian from an accident during heavy traffic areas. By implementing this smart setup, department will be able to find out the defaulters easily. This is more compatible and economical when setting up on a large scale. The pedestrian collisions occur due to the unethical behavior of the drivers skipping the signals can be avoided with the presented barrier model.

6.2.5. Annual maintenance and running cost @Rs. 1.00 Lakhs per year

This will also have an annual maintenance cost of Rs. 1.00 lakh per year.

6.2.6. Check naka duty staff in 3 members. 8hr duties for each@ Rs. 8500/months: At the check naka 3 guards will be placed from the respective JFMPCs and will be paid honorarium per month. Provision for honorarium has been done for 10 yrs of the project period. These will be based on the daily wages prevailing at the time of joining.

6.2.7. Cycle+ uniform + deployment etc to watchers and naka duity

Cycle, uniform and cost of deployment of to watchers will be provided while they are posted at the Check naka.

7. GIS and remote sensing for implementation and Monitoring

7.1. **RS & GIS software and accessories:** A high configuration gaming laptop or desktop with RS and GIS software will be procured for supporting the monitoring team and for documentation of the work done under the proposed wild life management plan.

7.2. **Remuneration to GIS expert @Rs.35000 per month * 12 months:** Working on GIS software is a highly specialized job and requires a person with

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skill set of operating the software and also getting interpretation out of the data gathered from the software.

7.3. **One computer operator @Rs. 20000/month * 12 months * 10 years:** Further one computer operator will be needed for supporting the office of the DFO. He will be responsible for keeping the soft copy of the documents related to the project.

7.4. **Setting up wildlife Monitoring center at CF office- Chatra:** The proposed mitigation plan will be monitored by the CF and RCCF. The CF office will be supported with a monitoring center for the proposed wild life implementation plan.

7.5. **Monitoring cell at DFO office:** With all facilities at the DFO office it will be responsible for monitoring of the implementation of the mitigation plan. The measures mentioned above will be part of the whole set up for monitoring at DFO's office.

8. Awareness promotion about Medicinal Plants and protection of endengered species

8.1. Public awareness

8.1.1. **Short Film Preparation @2.00 Lakhs * 4 years:** The plan has made a provision of 8 lakh rupees for shooting documentary film for the works done under the mitigation plan. Each year carried out activities will be documented and filmed to create a documentary on the overall programme.

8.1.2. Pamphlet Distribution and Nukkar Natak etc in local language for awareness @2.00 lakh per year: The folk culture and nukkad nataks have always been part of creating awareness among the communities. The literarute in local language is also a powerful tool for communication. For the two measures the plan has made provisions and will be done at the village level.

8.1.3. **Celebration of world environment Day, wildlife week etc:** Celebrating important days across the year will keep communities involved and will help in creating awareness at all levels. Secondly doing it in the schools and other public places will help in creating a ripple effect of the programme.

8.1.4. **Wall Painting, Sologan, Poster etc:** Wall paintings and slogans are a tool to create awareness. It also helps in making villages look better through nice local paintings.

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8.2. **Nature Interpretation Centre**

8.2.1. ***Construction of Nature Interpretation Center:*** To create interest and scientific temperament among public especially students, it is proposed to build and maintain a nature interpretation centre. The location is to be decided by the DFO Chatra South at the time of implementation. A sum of **Rs 125.00 lakhs** is provided for construction of the interpretation center on wildlife / nature conservation & Environment.

8.2.2. **Equipping Nature Interpretation Centre:** To display and showcase the importance of Wildlife a mini library, audio Visual Display System (Multimedia System with LED TV) will be equipped inside the Interpretation Centre to run Wildlife and Nature Related Documentaries. An expenditure of **Rs. 40.00 lakhs** will be made for equipping the center.

8.2.3. Live Edge Fencing with Entrance Gate: To secure the complex an expenditure of **Rs. 20.00 lakhs** will be incurred towards providing live hedge fencing with entrance gate.

8.2.4. Aesthetic Plantation/ Medicinal Garden: To improve the aesthetics of the centre and to attract youth landscaping plantation will be done at a cost of **Rs. 10.00 lakhs**.

8.2.5. Manpower: 2 unskilled persons is to be recruited to maintain the interpretation center. The remuneration of unskilled person will be @Rs. 12912.95 per month. Total cost of remuneration is **Rs. 31.00 lakhs** to be provided by user agency on demand note raised by DFO- Chatra South.

8.2.6. Running Expenditure: To pay the electricity bills etc., a provision of **Rs.20.00 Lakhs** at the rate of Rs.3.00 Lakh per annum is made.

8.2.7. Providing Solar Panel Set: A DG Set will be provided at the Centre as a backup power at the cost of **Rs. 15.00 lakhs**.

9. Corpus Fund

9.1. Corpus Fund for ex Gratia Payment (Lumpsum Rs. 10 lakhs) to be topped up on advice by CWLW amount to be disbursed based on demand note from DFO Chatra South

9.2. Contingency amount

Intervention to be done by the DFO-Hazaribag Wild Life Division

Hazaribag and its adjoining areas have been known for the scenic beauty of forest and its resources. Development has resulted in competing land uses and often forest land is needed for carrying these developmental activities. Mining is one of them. It is needed for development to take place but it has fall out on wild lives. To compensate and maintain the floral and faunal biodiversity wild life mitigation plan has been proposed which will be implemented by the Division under the guidance of the DFO.

Component-1 –Awareness generation and capacity building: The activities of awareness generation and capacity building will be jointly taken by the user agency and department. Materials for the capacity building will be supplied by user agency whereas the programme will be designed and conducted by the department.

- **Wildlife signages installation in affected villages and approach:** Wildlife warning signs are the most commonly used and widespread form of mining impact mitigation, aimed at reducing the incidence of wildlife-vehicle collisions. Effectiveness of signs often indicates minimal change in driver behavior. However it makes drivers aware of the different animals in the area.

  Provision of Rs.12.00 lakh has been made for the proposed activity.

- **Training and awareness to EDCs, in schools, Village Level volunteers for wildlife conservation & protection with man - wild animal conflict management:** Human-wildlife conflict refers to negative interactions between people and wild animals that have consequences for humans, wildlife, or both. This usually occurs when the needs or behaviors of wildlife intersects with the needs or behaviors of people (or the other way around), resulting in adverse ramifications such as damaged crops, loss of livestock, or even loss of human lives. Less obvious impacts of conflict include the transmission of a disease if an animal bites a human, collision between animals and vehicles, targeted hunting, and fear-based attacks.

  Provision of Rs.20.00 lakh has been made for the proposed activity.

- **Training to Forest force for using tranquilizing gun with doses for different wild animals with resource person:** Man animal conflict has been on the rise due to the diversion of forest land and competing land use for various purposes.

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The plan has made a provision of Rs.10.00 lakh for the said activities.

- **Provision of feeding trough for cattle in villages:** Since the villagers keep large herds and with tradition of open grazing. This creates conflicts between the villagers and the department. to reduce this conflict provision has been made for distribution of feeding trough.

  The plan has made a provision of Rs.20.00 lakh for the said activities.

- **Solarised Livelihood Station:** 2 Solarised livelihood station has been proposed for facilitating value addition at the village level without having dependency on fossil fuel or grid electricity.

  The plan has made a provision of Rs.25.00 lakh for the said activities.

Component 02: Forest Fire Management

Fire is the most potential threat to the flora and fauna of the area. Incidences of fire mayhappen due to various reasons and it cost very heavy for the forest and wild life residing in the forest. To protect forest from fires following measures has been proposed –

- **Forest Fire Management Squad:** It requires to be placed an equipped team for controlling and reducing forest fire incidences. Fire tracer will be hired for a period of 5 months from February to June every year by the department as these are the months when forests are more prone to forest fire.

  Provision of Rs.52.50 lakh has been done for this activity.

- **Forest Fire Fighting Equipment**: In order to equip the fire fighting squad itis proposed to provide the following equipments like Fire Blower, bush cutter and fire fighting suit etc.

  Provision of Rs.23.00 lakh has been done for this activity.

- **Fire fighting vehicle:** Forest fire occurs despite of the efforts by the department and its front line workers along with community. A fire fighting vehicle will help in dodging forest fire at the fast pace and will also help in meeting water requirement by the animals.

  Provision for a fire fighting vehicle with driver and cost of fuel has been made under the plan. A total cost of Rs.80.00 lakh has been made for the proposed activities.

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Component 03: Habitat and water Management

- **Habitat improvement through plantations with fruit bearing trees:** An edible landscape is special in that it is planted with trees and shrubs that produce foods that we can eat/sell or that are beneficial for wildlife. Trees and shrubs can be used to provide shade, to improve microenvironments or to protect crops, or to mitigate challenging environmental issues.

  Provision of Rs.217.50 lakh has been done for this activity.

- **Bamboo plantations:** Soil Organic Carbon is one of the most important components that delineate the productivity of a terrestrial ecosystem. Bamboo being a good plant for wild animals especially that of elephant planting bamboos will improve the availability of fodder for the animals and there will be reduction in raiding in the villages.

  Provision of Rs.144.00 lakh has been done for this activity.

- **Silvicultural operations:** Among the different schemes that the forest department works in the state one important scheme is the silvicultural operations through which revival of degraded forests are done. By doing it health of the forest is improved by regeneration of the stumps and other small subdued growing plants.

  Provision of Rs.150.00 lakh has been done for this activity.

- **Removal of lantata from the forest:** Weed infestation has been one of the crucial challenges of the department especially that of lantana as this causes severe damage to the local bio diversity.

  Provision of Rs.30.00 lakh has been made for this activity.

- **Check dams:** A check dam is constructed across drainage ditch, or waterway to counteract erosion by reducing water flow velocity. In contrast to big dams, check dams are implemented faster, are cost effective, and are smaller in scope. These help in conserving water, improving ground water and also it supports wild life during the summer.

  Provision of Rs.64.00 lakh has been done for this activity.

- **Desiltation of check dam:** Earlier built check dams have been filled with silt coming from the erosion of the catchment area and their impounding area have been decreased to minimum some places even zero.

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It requires to desilt these structures for improving availability of water and habitat improvement also.

Provision of Rs.60.00 lakh has been made for desilting 20 such structures.

- **Wildlife Habitat Improvement (Water Holes):** The influence of wildlife management with the goal of maintaining wildlife population and the entire biodiversity at maximum level and maximum ecosystem utilization depend heavily on the knowledge of mineral elements in the nutrients requirement of animals. Salt licks are deposit of mineral salts used by animals to supplement their nutrition, ensuring enough minerals in their diets.

  Provision of Rs.37.50 lakh has been done for this activity.

- **Support for veterinary services: Support for veterinary services:** As and when required support of a trained veterinarian will be sought for treatment and care of the wild animals. Veterinary services will be taken for:
  - Clinical services (treatment of diseased animals)
  - Preventive services (avoiding the outbreak of diseases)
  - Provision of drugs, vaccines and other products

  Provision of Rs.72.00 lakh has been done for this activity.

- **Contour trenches:** Contours in the forest area helps in reducing erosion and improving water recharge through arresting runoff water and soil.

  Provision for contour trenches in 200 ha has been made under the plan.

- **Gabbion plantations:** provision for 10000 gabbion plantations has ben done for improving the natural environment for housing of birds.

  Provision of Rs.45.00 lakh has been done for the same.

Component 04: Anti- Depredation Activities

- **Torch distribution, Jute bag made marshal distribution among wildlife affected population:** Animals usually move away from lights. Distribution of torches and Mashal will help villagers in keeping the wild animals away from human population. By lighting mashal people can drive away animals in the forest when they come closer to habitations.

  Provision of Rs.15.00 lakh has been made for the same.

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- **Rescue cages:** Rescue cages will be procured for reducing damage done to the teeth and nail of the captured wild animals due to the iron rod or mesh. These are cages which are safer for wild animals and help in transport easy.

  Provision of Rs.3.00 lakh has been made for the same.

- **Provision of a rescue van with all facilities**: rescuing injured animals has always been a challenge as the various needs of the animals need to be met with.

  Provision of Rs. 35.00 lakh has been made for the procurement of the rescue van.

- **Provision for anti depredation material as per need:** Anti depredation materials have been in use by the department and communities to drive away the wild animal once they come close to villages. It keeps the casualties at minimum and helps communities to counter elephant raiding and attack by other animals.

  Provision of Rs. 20.00 lakh has been done for this activity.

- **Snakes Catching Equipments:** Despite the fact that most of the snakes found in the forest are non poisonous people die due to snake bite from the fear. It will be important to distribute snake catching equipments to the persons having skill to catch snakes. Training to catch snakes will also be important.

  Provision of Rs. 1.75 lakh has been done for this activity.

- **Training to trackers/watchers:** Wild animals generally come out of their safe zone during wee hours to nearby water bodies and fringes of villages in search of food. This makes them susceptible to have confrontation with humans and result in subsequent man-animal conflict.

  Provision of Rs. 15.00 lakh has been done for this activity

- **Camera traps:** To track and keep movements of animals in direct supervision camera traps are a better tool. These also help in animal census with proper evidence.
  Provision of Rs.32.00 lakh has been made for it.

- **Animal Rescue and treatments:** Animal welfare describes how an animal is coping mentally and physically with the conditions in which it lives. Contemporary animal welfare practice has moved beyond only providing the

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

five freedoms and focuses on animals having a Life Worth Living. This encompasses both physical and mental wellbeing, and includes the ability to demonstrate natural species-typical behaviours.
Provision of Rs. 40.00 lakh has been done for this activity

- **Solarisation of the buildings:** Solar based systems will be uilt on the different buildings for reducing dependency on the grid electricity and also to reduce the emission from the use of grid electricity.

  Provision of Rs.20.00 lakh has been done for this.

- **8 trackers @10500/month for 10 years:** To keep a vigil on the offenders it require to use technology supported by manual operation. Trackers will be hired round the year for keeping a vigil on the offenders. These will also work as guide for the vistors in the sanctuaries and wild life habitats.
  Provision of Rs. 100.80 lakh has been made for it.

- **Vehicles for monitoring on rent (with driver, diesel and fuel)for CF and other higher officials:** Two vehicles will be hired for monitoring by the officers apart from the DFO of the division. These vehicles will also have provision for drivers and fuels along with maintenance.
  Provision of Rs.72.00 lakh has been made for it.

- **Vehicles for patrolling on rent (with driver, diesel and fuel) for RFO:** At the range office a vehicle will be hired for the movement of the RFO and it will also have provision for diesel and driver along with maintenance.
  Provision of Rs.62.40 lakh bas been made for it.

- **Procurement of one wireless set of handsets walkie talkie for communication for patrol:** Wireless set will help in keeping in touch while in forest during the patrolling. It will help in better coordination and management of the wild animals in the area.

  Provision of Rs.30.00 lakh bas been made for it.

- **Tranquilizing guns with medicines:** Tranquilizing guns with medicines will be procured for use by the trained staff to reduce damage to wild animal and human populations also.

  Provision of Rs.20.00 lakh has been made for it.

SADALA SATYANARAYAN
Project Officer
Magadh OCP

- **Drone surveillance:** Drone surveillance system will be procured and deployed for keeping track of the offenders with vehicle. These drone systems will help in tracking and arresting the fleeing offenders.
  A provision of Rs. 23.10 lakh has been kept for it.

- **Safety kits:** Safety kits will be procured for the front line workers who participate in raids carried out by department.
  Provision of Rs.24.21 lakh has been kept for it.

Component 05: Facilitating monitoring and evaluation

- **Maintainance of vehicles and cost for driver of rescue van:** One Tempo travler ambulance for animals rescue for Hazaribag wild life Division and for people injured in the man animals conflict will be procured and it will be maintained along wth driver under the proposed plan.
  Provision of Rs.60.00 lakh has been made for it.

- **Refurbishment and maintenance of the old buildings**: There are many buildings that has been nuilt at serene locations with potential of eco tourism but has been lying unutilized. Those buildings will be developed and maintained.
  A provision of Rs. 73.00 lakh has been made for it.

- **Procurement 1 computer desktop & printer hard ware setup for Range and wage of Computer Operator (1):** To keep track of progress and make it in digital form for convenience of every one a computer with all accessories like printers has been kept in provision. This will help in making proper records.
  A provision of Rs. 45.80 lakh has been made for it.

- **Provision for consumable for vehicles and offices:** Cost for meeting daily requirement for vehicles and offices will be provided under the plan.
  A sum of Rs. 37.00 lakh has been made under the plan.

- **Research biologist:** Support of a research biologist will be at the services of the DFO and provision for Rs.48.00 lakh has been done.

- **Support of two professionals:** To assist the DFO two professionals aill be placed at the DFO's office. A provision of Rs. 84.00 lakh has been done for it.

- **Contingency and escalations:** A contingency reserve will be maintained throughout the project time period so as to compensate for any accidents or loss which might take place at that period of time.

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

Chapter-5

Interventions to be done by the User Agency

Mining will have adverse impact on the wild life and local ecosystem as large number of trees will be cleared for the mining. Mining projects create disturbances mostly during the mining operation phase. Later on due to regular maintenance by the Department plants are not allowed to grow and canopy gets maintained. To mitigate the negative impact of the mines it is proposed to have a wild life mitigation plan that will reduce the impact of the mines on the wild life. Various activities have been proposed under five major components that are being mentioned below.

The different interventions that have been proposed are based on the impacts that have been assessed during the field visit and subsequent discussion with the community and feedback from the forest officials. Interventions proposed are segregated under five major heads.

Use agency will deposit the approved budget and will help in implementation through the volunteers from different villages in impact area.

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

Chapter-6:
Detailed Cost Sheet For Project And Project Impact Area

The estimate has been determined based on the rates of the current year and then to accommodate the escalation a provision for 20 % has been kept. The base estimate has been prepared using a variety of different techniques depending on the level of scope definition and the size and complexity of the project. As the design progresses and more details are known, project components become more detailed. The base estimate is also dependent on the estimated project schedule.

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SADALA SATYANARAYAN
Project Officer
Magadh OCP

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
A	Biodiversity Enhancement											
A.1	Forest Restoration by method of Silviculture and gap filling plantation - 300 hectare	206.00	37.50	8.00	8.00	0.00	0.00	0.00	0.00	0.00	0.00	259.50
A.2	Afforestation on degraded land, hill , blank patches, 150 hactare	150.00	72.00	35.00	24.00	24.00	10.00	10.00	12.00	12.00	12.00	361.00
A.3	bamboo plantation 100 hactare	86.24	32.64	12.85	11.25	0.00	0.00	0.00	0.00	0.00	0.00	142.98
A.4	Salt Licks (@ Rs 80000 per annum * 10 years	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	8.00
A.5	water holes (Rs 40000 per hole * 100 holes)	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	4.00
A.6	Provision for water tanker for wildlife and forestary with lifting pump, driver, POL and maintenance	19.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	4.40	59.00
A.7	Conservation Measures for bird species: conservation measure for SCS(species of conservation significance)(woodland, grassland, water and migratory bird)	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	100.00
A.8	Cotour Cutting + Soil water Conservation as per the PCCF Devlopment order 36 date 18.8.2019 having 100 man-days per hectare for a total area of 600 ha(@Rs 350 * 100 workers * 600 ha)	35.00	35.00	35.00	35.00	35.00	35.00	0.00	0.00	0.00	0.00	210.00
A.9	Checkdam Pakka 15 in numbers each costing 15 lakhs	60.00	60.00	60.00	45.00	0.00	0.00	0.00	0.00	0.00	0.00	225.00
A.10	Loose boulder check dam in Nallas	15.00	15.00	15.00	15.00	15.00	0.00	0.00	0.00	0.00	0.00	75.00
A.11	Creation of Ponds 15 in Numbers @6 Lakhs	18.00	18.00	18.00	18.00	18.00						90.00
A.12	Earthen Checkdam 15 in numbers @6 Lakhs	18.00	18.00	18.00	18.00	18.00						90.00
A.13	Maintainance and repair of pakka and Earthen Checkdam,LBCD an ponds mentioned above in Sl. No. A.9, A.10, A.11, A.12	0.00	0.00	0.00	0.00	0.00	20.00	20.00	25.00	30.00	30.00	125.00
A.14	Linear Plantation along Rivers, canals, Roads total plants 20000	0.00	125.00	12.00	15.00	6.00	12.00	0.00	0.00	0.00	0.00	170.00
	SUB TOTAL	618.84	428.74	229.45	204.85	131.60	92.60	45.60	52.60	57.60	57.60	1919.48

NIRPENDRA NATH
Project Officer
Magadh Project

Conservator of Forests
Territorial Circle, Chatra

SADALA SATYANARAYAN
Project Officer
Magadh DCP

Divisional Forest Officer
Chatra South Forest Division

Regional Chief Conservator of Forests
Gaya

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
B	**Measures for Forest Protection, Anti-depredation and wildlife protection**											
B.1	Deployment of 10 Home Guards @ 20000 per months	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	24.00	240.00
B.2	Logistic and deployment cost of Home Guards	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	72.00
B.3	Cost of mobile set @ Rs. 10000 * 10 = 100000 (considering life 5 years) and recharges	1.25	0.25	0.25	0.25	0.25	1.25	0.25	0.25	0.25	0.25	4.50
	SUB TOTAL	**32.45**	**31.45**	**31.45**	**31.45**	**31.45**	**32.45**	**31.45**	**31.45**	**31.45**	**31.45**	**316.50**
C	**Capacity building and procurement of anti- depredation items**											
C.1	Provision for Crackers and other items	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
C.2	Snakes Catching Equipments	1.25										1.25
C.3	Training to trackers/watchers	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	15.00
C.4	Rewards for information	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
C.5	Animal Rescue and treatments	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	40.00
C.6	payment towards cost of establishing wild animal rescue team including service of one veterinary Doctor @ 60000/month, one paramedics/paravet@ 25000/months and two daily wage worker @ Rs. 326.85 * 30* 12*2 person=2.40 Lakhs per year	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	12.72	127.20
C.7	Construction of machans along Paddy fields @4000 per machan * 40 machans * 2 items	1.60					1.60					3.20
	SUB TOTAL	**25.07**	**22.22**	**22.22**	**22.22**	**22.22**	**23.82**	**22.22**	**22.22**	**22.22**	**22.22**	**226.65**
D	**Fire Prevention and Protection of Habitat**											
D.1	Fire line creation for 50 km @ Rs. 30500 per km * 50 km	15.25										15.25
D.2	Maintainance cost of fire line having 20 mans day per km every year @Rs. 350.00 per day *20 person* 50 km*10 yeats	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	35.00
D.3	Construction of 2 watch tower cum temporary shalter with solar and water facilities @12.00 Lakhs	24.00										24.00
D.4	2 watchers at each tower ie total 2 watchers @Rs.10050.00/months	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	50.40
D.5	Fire Fighting squard Cost of wages of fire watchers for 4 months @Rs 350 per day* 30 day* 5 months*10 years * 10 persons	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	52.50
D.6	Fire fihting equipments											
D.6.i	cost of mobile set @ Rs. 10000*6(two times in 10 years) and recharge	1.20	0.20	0.20	0.20	0.20	1.20	0.20	0.20	0.20	0.20	4.00

NIRPENDRA NATH
Project Officer
Magadh Project

Conservator of Forests
Territorial Circle, Chatra

SADALA SATYANARAYANA
Project Officer

Divisional Forest Officer
Chatra South Forest Division

Regional Chief Conservator of Forests

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
D.6.ii	Cost of fire fighting suit @ Rs 7000 per person (considering life 5 years)	0.70					0.70					1.40
D.6.iii	Cost of rented vehicles @50000 per months * 6 months	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
D.6.iv	Purchase of fire blower @ Rs. 60000*10 blowers = Rs. 6.00 Lakhs	6.00										6.00
D.6.v	Running and maintainance of fire blower and cutting @ Rs. 30000 per blower per year * 10 blower	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
D.6.vi	Purchase of brush cutter @Rs. 30000 * 10	3.00										3.00
	SUB TOTAL	69.94	19.99	19.99	19.99	19.99	21.69	19.99	19.99	19.99	19.99	251.35
E	**Livelihood improvement and capacity building to local people**											
E.1	Providing alternate livelihood support											
E.1.i	Farming of Medidinal Plants ,Duchary, fishary, honey bee keeping, mushroom cultivation etc. @ 9 Lakhs for 5 years	9.00	9.00	9.00	9.00	9.00						45.00
E.1.ii	Distribution of Sal plates making machine and other equipments	2.00	2.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	36.00
E.1.iii	Bamboo craft making	1.50	1.50	1.50	1.50	1.50	1.50					9.00
E.2	**Capicity building to local people in fringe villages**											
E.2.i	solar street light @ Rs. 20000 per solar light for 500 lights	10.00	10.00	10.00	10.00	10.00						50.00
E.2.ii	Providing Grain bins @ Rs. 2000*150 bins	3.00										3.00
E.2.iii	Long range rechargable tourch lights @ Rs. 2000*150 torch	3.00										3.00
E.2.iv	Training and capacity building of JFMC @ Rs. 20.00 Lakhs	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
E.2.v	Seed money for implementation of micro plan for JFMC @ Rs. 2.00 Lakhs per JFMC for 20 JFMC with focus of flora of medicinal and other ecological importance	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	40.00
E.2.vi	Construction of shelter house/barrack	35.00										35.00
E.2.vii	Water Conservation/drinking water sources with purpose to local villagers	10.00	10.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	50.00
	SUB TOTAL	85.50	44.50	46.50	46.50	36.50	7.50	6.00	6.00	6.00	6.00	291.00

NIRPENDRA NATH
Project Officer
Magadh Project

Conservator of Forests
Territorial Circle, Chatra

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Regional Chief Conservator of Forests

Divisional Forest Officer
Chatra South Forest Division

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
F	Capacity building of forest department for implementing ,monitoring and supervision of plan											
F.1	Equipment for Monitering											
F.1.i	Cost of Digital camers and drone	5.00										5.00
F.1.ii	cost of night vision binocular,GPS	4.00										4.00
F.1.iii	Provision for 6 motercycle @ Rs. 1.5 lakhs per motercycle	9.00										9.00
F.1.iv	Maintainance of motorcycles @ Rs. 12000 per year per motercycle * 6 numbers	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	7.20
F.1.v	POL for six motercycle @Rs. 100/ liters, 30 liters/ month per vehicles	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	2.16	21.60
F.1.vi	vehicles for monitoring on rent (with driver, diesal and fuel)for CF and other higher officials	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	84.00
F.1.vii	Vehicles for implementation on rent (with driver, diesal and fuel) for RFO	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	72.00
F.1.viii	4 unskilled JFMC members DFO/RFO for patrolling to augment work force @Rs. 8500 per months	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	5.04	50.40
F.1.ix	one multitasking technical staff to support DFO for implementetion and monitoring of wildlife Plan @40000 per month	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	48.00
F.2	Check Naka											
F.2.i	Check Naka buildings	20.00										20.00
F.2.ii	solar power	2.50										2.50
F.2.iii	CCTV camera for Servellance	2.50										2.50
F.2.iv	Automated road crossing	2.00										2.00
F.2.v	Annual maintainance and running cost @Rs. 1.00 Lakhs per year	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
F.2.vi	check naka duty staff in 3 members. 8hr duties for each@ Rs. 10500/months	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	3.78	37.80
F.2.vii	Cycle+ uniform + deployment etc to watchers and naka duity	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	10.00
	SUB TOTAL	79.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	34.10	386.00

NIRPENDRA NATH
Project Officer
Magadh Project

Conservator of Forests
Territorial Circle, Chatra

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Regional Chief Conservator of Forests

Divisional Forest Officer
Chatra South Forest Division

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
G	**GIS and remote sensing for implementation and Monitoring**											
G.1	RS & GIS software and accessories	10.00	0.00	0.00	5.00	0.00	0.00	5.00	0.00	0.00	5.00	25.00
G.2	Renumeration to GIS expert @Rs.35000 per month * 12 months	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	42.00
G.3	One computer operator @Rs. 20000/month * 12 months * 10 years	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	24.00
G.4	Setting up wildlife Monitoring center at CF office, Chatra	10.00										10.00
G.5	Monitoring cell at DFO office	20.00										20.00
	SUB TOTAL	**46.60**	**6.60**	**6.60**	**11.60**	**6.60**	**6.60**	**11.60**	**6.60**	**6.60**	**11.60**	**121.00**
H	**Awareness promotion about Medicinal Plants and protection of endengered species**											
H.1	**Public Awareness**											
a.	Short Film Preparation @2.00 Lakhs * 4 years	2.00			2.00			2.00			2.00	8.00
b.	Pamphlet Distribution and Nukkar Natak etc in local language for awareness @2.00 lakh per year	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	20.00
c.	Celebration of world environment Day, wildlife week etc.	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
d.	Wall Painting, Sologan, Poster etc.	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	15.00
H.2	**Nature Interpretation Center**											
i	Construction of Nature Interpration Center @ 100 lakhs	100.00										100.00
ii	Equipping Nature Interpretation Centre	40.00										40.00
	Live Edge Fencing with Entrance Gate	20.00										20.00
	Aesthetic Plantation/ Medicinal Garden	10.00										10.00
iii	2 skilled Manpower for maintainance of center @Rs. 12545/month * 12 month* 2 persons	3.01	3.01	3.01	3.01	3.01	3.01	3.01	3.01	3.01	3.01	30.10
iv	Running expenditure @Rs. 3.00 lakhs per year	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	30.00
v	Solar panel @ Rs. 15 Lakhs	7.00		2.00			6.00					15.00
	SUB TOTAL	**191.51**	**12.51**	**14.51**	**14.51**	**12.51**	**18.51**	**14.51**	**12.51**	**12.51**	**14.51**	**318.10**

NIRPENDRA NATH
Project Officer
Magadh Project

Conservator of Forests
Territorial Circle, Chatra

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Divisional Forest Officer
Chatra South Forest Division

Proposed activities to be implemented in Chatra South Forest Division

S.N.	Particulars	Expected expenditure during ten year (Rs In Lakhs)										Total
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	
I	**Corpus Fund**											
I	Corpus Fund for ex Gratia Payment (Lumpsum Rs. 10 lakhs) to be topped up on advice by CWLW amount to be disbursed based on demand note from DFO	100.00										100.00
II	Contigency amount	10	10	10	10	10	10	10	10	10	10	100.00
	SUB TOTAL	**110.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**10.00**	**200.00**
	GRAND TOTAL	**1259.01**	**610.11**	**414.82**	**395.22**	**304.97**	**247.27**	**195.47**	**195.47**	**200.47**	**207.47**	**4030.28**
	Escalation @20%	**251.802**	**122.022**	**82.964**	**79.044**	**60.994**	**49.454**	**39.094**	**39.094**	**40.094**	**41.494**	**806.056**
	Total Cost											**4836.34**
	Note:- The Proposal Activities Shall be Implemented within 10 km radius of the lease area of Magadh Coal Block											

27/6/23
PO-Magadh OCP
NIRPENDRA NATH
Project Officer
Magadh Project

DFO-Chatra South Forest Division
Divisional Forest Officer
Chatra South Forest Division

13/7/23
CF-Chatra
Conservator of Forests
Territorial Circle, Chatra

13/7/23
RCCF-Hazaribag
Regional Chief Conservator of Forests
Hazaribagh

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Wildlife Conservation and Management Plan (Mitigation Measure)- Activities proposed in Hazaribag Wild life Division For the period of 10 yrs (All amount in lakh INR)					Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10
	Items Proposed	*Unit cost in lakh INR*	*Total Units*	*Financial Outlay*	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin
Component 01: Awareness Generation & Capacity Building														
1	Wildlife signages installation in affected villages and approach	Ls		12.00	3.00	3.00	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
2	Training and awareness to EDCs, in schools, Village Level volunteers for wildlife conservation & protection with man - wild animal conflict maugement	Ls		20.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
3	Training to Forest force for assisting trainquilising gun with doses for different wild animals with resource person	0.2	50	10.00	5.00	5.00								
4	Provision of feeding trough for cattle in villages			20.00	5.00	5.00	5.00	5.00						
5	Solarised livelihood station	12.5	2	25.00	12.50	12.50								
	Sub Total component-01			87.00	27.50	27.50	7.75	7.75	2.75	2.75	2.75	2.75	2.75	2.75
Componenct-02: Fire management														
6	Fire Fighting Equipments and its maintenance			23.00	10.00	10.00	0.00	1.00	0.00	1.00	0.00	1.00	0.00	0.00
7	Fire Monagement squad	52.5	1	52.50	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25	5.25
8	Fire fighting vehicle	20	1	20.00	20.00									
9	Fuel cost for fire fighthing vehicle and maitenance	0.2	120	36.00	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
10	Cost for Driver	0.2	120	24.00	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40	2.40
	Sub Total Component-02			155.50	41.25	21.25	11.25	12.25	11.25	12.25	11.25	12.25	11.25	11.25
Component 03: Habitat and water Management														
11	Habitat improvement through plantations of fruit bearing trees in 150ha	1.45	150	217.50	104.10	63.87	15.66	15.15	13.68	5.04				
12	Bamboo plantation in 100 Ha	1.44	100	144.00	86.26	32.64	12.85	12.25						
13	Silvicultural operations in 200 ha	0.75	200	150.00	37.50	37.50	37.50	37.50						
14	Removal of lantata from the forest	0.15	200	30.00	10.00	10.00	10.00							
15	Cbeckdams	8	8	64.00	14.00	14.00	14.00	14.00	8.00					
16	Desiltataion of checkdams	3	20	60.00	15.00	15.00	15.00	15.00						
17	Wild life Habitat Improvement (Water Holes and Salt Lick)	0.75	50	37.50	7.50	7.50	7.50	7.50	7.50					
18	Support for veterinary services	0.6	120	72.00	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
19	Contour trenches	0.18	200	36.00	9.00	9.00	9.00	9.00						
20	Gabbion plantations	0.0045	10000	45.00	10.00	10.00	10.00	10.00	5.00					
	Sub Total Component03			856.00	300.56	206.71	138.71	127.60	41.38	12.24	7.20	7.20	7.20	7.20
Component 04: Anti- Depredation Activities														
21	Torch distribution, Jute bag made marshal distribution or others among wildlife affected population /Forest personal	Lsp		15.00	6.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	Portable Cages with accessories or others as per need	Lsp	1	3.00	3.00									
23	Provision of a rescue van with all facilties	Lsp	1	35.00	35.00									
24	Provision for andtideoradation material as per need			20.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
25	Snakes Catching Equipments			1.75	0.75			0.50			0.50			
26	Training to trackers/watchers			15.00	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
27	Camera Traps and maiutaiuance			32.00	14.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
28	Animal Rescue and treatments			40.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
29	Solarisation of the forest buildings			20.00	10.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.00
30	8 Trackers @10500/mouth for 10 years	0.84	120	100.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80	10.80
31	vehicles for monitoriug on rent (with driver, diesal and fuel)for DFO			72.00	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20
32	Vehicles for patrolling on rent (with driver, diesal and fuel)			62.40	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.24	6.28
33	Procurement and maintenance of one wireless handsets walkie tallie for conmuuication for patrol	Ls		30.00	21.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
34	Trainquilising gun with medicine	10	2	20.00	11.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
35	Drone survilauce for trackiug tresspassers			23.10	23.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

NIRPENDRA NATH
Project Officer
Magadh Project

SADALA SATYANARAYAN
Project Officer
Magadh CCP

Wildlife Conservation and Management Plan (Mitigation Measure)- Activities proposed in Hazaribag Wild life Division For the period of 10 yrs (All amount in lakh INR)		Unit cost in lakh INR	Total Units	Financial Outlay	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6	Year-7	Year-8	Year-9	Year-10
	Items Proposed				Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin	Fin
36	Safety kits with helmet and body shield and other items for front line force			24.21	15.21	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	SubTotal Component-04			514.25	170.80	38.74	38.74	39.24	38.74	38.74	40.24	38.74	38.74	38.78
Component 05: Facilitating monitoring and evaluation														
37	Maintainance of vehides and cost for driver of rescue van			60.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
38	Refurbishmeut and maintenance of Old buildings	Lsp		73.00	46.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
39	Computer and operator cost with GIS software			45.80	8.00	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20
40	Provision for consumable for vehicles and offices			37.00	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70	3.70
41	Research biologist			48.00	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80	4.80
42	Support for 2 professionals to assit the DFO			84.00	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40	8.40
	SubTotal Component05			347.80	76.90	30.10	30.10	30.10	30.10	30.10	30.10	30.10	30.10	30.10
				1960.55	617.01	324.30	226.55	216.94	124.22	96.08	91.54	91.04	90.04	90.08
43	Contingency and escalations			392.11	123.40	64.86	45.31	43.39	24.84	19.22	18.31	18.21	18.01	18.02
		Total cost		2352.66	740.41	389.15	271.85	260.32	149.06	115.29	109.84	109.24	108.04	108.10

NIRPENDRA NATH
Project Officer
Magadh Project

SADALA SATYANARAYAN
Project Officer
Magadh OCP

Divisional Forest Officer
Wildlife Division, Hazaribag

CCF-Wild Life
मुख्य वन संरक्षक
वन्य प्राणी, झारखण्ड, राँची

Public Consultation

To ensure people's concerns and feedbacks about the project are incorporated in the project design and to promote public understanding about the project developments and its implications. Public consultation and information dissemination are treated as a two way process through which the information is passed on to public and their feedback is sought to understand their issues. Consultations during implementation stage helps to facilitate a smooth resettlement of the PAFs thereby enabling speedy implementation of the project.

The overall goal of the consultation programme is to disseminate project information and to incorporate PAFs views and feedbacks in the preliminary project design and Resettlement Action Plan. The specific objectives of the consultations are to:

(i) Improve project design aspects and lead to fewer conflicts and delays in implementation;

(ii) Facilitate development of appropriate and acceptable entitlement options;

(iii) Increase long-term project sustainability and ownership;

(iv) Reduce problems for institutional coordination;

(v) Make the resettlement process transparent; and

(vi) Increase effectiveness of sustainability of income restoration strategies and improve coping mechanisms.

Stakeholders are those who have a direct interest in project development, directly or indirectly affected due to project and whose participation needs to be ensured in consultations at various stages. For consultation and participation primary and secondary stakeholders are to be identified. The following are the major stakeholders:

(i) All Project Affected Persons (PAPs) and Households, Beneficiaries of the Project, including representatives of Vulnerable Households;

(ii) Elected representatives, Community leaders of PAPs, representatives of CBOs

(iii) Designated staff of Magadh -OCP Unit and from the project affected villages

01-12-23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

List of experts for preparation of the wild life management plan

Sl no	Name	Education	Experience	Role
1	Hemant Kumar	B Sc Forestry	24 Yrs	Team leader
2	Divyanshu Ganjir	M Tech	2 Yrs	GIS Expert
3	Sumant Kumar	Dip in watershed	14 Yrs	Watershed expert
4	Jai Prakash Tiwari	Inter	15 Ysr	Community mobilizer
5	Dwarika Bediya	Inter	3 Yrs	PRA and planning expert
6	Nisar Ahmad	Graduation	12 Yrs	Survey and net planning
7	Nayum Ansari	Graduation	11 Yrs	PRA and net planning

SADALA SATYANARAYAN
Project Officer
Magadh OCP

ANNEXURE-II B

Office of the Principal Chief Conservator of Forests,
Wildlife & Chief Wildlife Warden, Jharkhand.
Van Bhawan, Doranda, Ranchi-834002
Email : pccf-wildlife@gov.in,Phone No. 0651-2481744

LiFE Lifestyle for Environment

Office Order No....57..... **Date.**29/11/2023

Sanction Order of the combined Site-Specific Wildlife Management Plan with reference to (i) Diversion of 96.72 ha of forest land for Magadh OCP in Rajhara area in favour of M/s Central Coalfields Limited (CCL), presently in Chatra South Forest Division in Chatra district of Jharkhand.

AND

(ii) Proposed Diversion of 192.36 ha of forest land for Magadh OCP Phase -2 in favour of M/s Central Coalfields Limited (CCL), in Chatra South Forest Division in Chatra district of Jharkhand.

The instant Site-Specific Wildlife Management Plan (referred to as "the Plan" here in after) has been submitted by M/s. **Central Coalfields Limited (CCL)** (referred to as "the User Agency or M/s CCL ") in pursuance of the following conditions/ Terms of Reference laid by MoEF&CC under item no 18 of Stage-II vide letter no F.No. 8-38/2008-FC dated 18.10.2010 for diversion of 96.72 Ha of forest land under Magadh OCP in Rajhara area in favour of M/s Central Coalfields Limited (CCL), presently in Chatra South Forest Division in Chatra district of Jharkhand.

The aforesaid Terms of Reference laid by the Central Government reads as follows:

> ***Condition no 18-*** *"The User Agency to bear cost of implementation of conservation plan to be prepared in consultation with the CWLW of the state for the Hazaribagh National Park and its buffer zone adjoining CCL mining zone"*

As per the report submitted by Regional Chief Conservator of Forests, Hazaribagh, vide his office letter no. 1766 dated 18.07.2023 , the User Agency or M/s CCL submitted proposal for Magadh OCP Phase-2 to Government Of India for diversion of remaining 192.36 ha forest land under Chatra South Forest Division . With reference to this diversion proposal MoEF & CC Govt of India raised queries on 14 points vide their letter no. F.No. 8-27/2022 FC dated 28.04.2023, out of which following queries were related to preparation and implementation of Wildlife Management Plan by User Agency –

Query no. vii – *The undertaking to bear the cost of of implementation of Wildlife Management Plan has not been submitted by the user agency which shall be provided.*

Query no. xi – *As per the information received, the condition no 18 of the Stage-II approval dated 18.10.2010 for diversion of 96.72 ha forest land has not been complied, which needs justification. Moreover, a copy of Wildlife Management Plan approved by the CWLW shall be submitted.*

Query no. xiii –*The State Government shall furnish details of steps taken by the State Forest Department to rectify the lapses happened in the past regarding the implementation of WLMP of 96.72 ha proposal in the past.*

29/11/23
SADALA SATYANARAYAN
Project Officer
Sanction Order Magadh OCP Phase-II 29-11-2023

In compliance of the condition laid by MoEF&CC under item no 18 of Stage-II vide letter no F No 8-38/2008-FC dated 18.10.2010 for diversion of 96.72 ha of forest land under Magadh OCP in Rajhara area and query raised with reference to diversion of remaining 192.36 ha forest land under Chatra South Forest Division, vide their letter no F.No 8-27/2022 FC dated 28.04.2023, the User Agency M/s Central Coalfields Limited (CCL) submitted a combined Site Specific Wildlife Management Plan for both diversion of forest land proposals of Magadh project prepared in consultation with Divisional Forest Officer, Chatra South Forest Division and RCCF Hazaribagh for forest land involved in both the proposals (96.72 ha + 192.36 ha. Total - 289.08 ha) falling in Chatra district, as the impact area of aforesaid both the proposals is same

In the above stated background, the Regional Chief Conservator of Forests, Hazaribagh (RCCF, Hazaribagh) vide his letter no 1766 dated 18.07.2023 has submitted the Plan to the office of the undersigned for its due sanction

In order to examine the plan prescriptions a communication was issued to the Regional Chief Conservator of Forests, Hazaribagh, vide this office letter no 1295 dated 13.10.2023, to arrange a Power-Point Presentation of the plan on 17-10-2023 in the Office chamber of the undersigned. The presentation was made by the Project proponent in the presence of RCCF, Hazaribagh, Chief Conservator of Forests Wildlife, Ranchi, DFO Chatra South Forest Division, DFO Hazaribagh Wildlife Division, Sri Ranjan Samanta, CM (Env.) CCL-HR, Sri Nirpendra Nath, General Manager, Magadh Sanghmitra Area, CCL, Sri Mrigank Shekhar, Asstt Manager (Env.) Magadh OCP, Rabeya Naaz, Dy Mgr (Env.), CCL Hq. and Sri Hemant Kumar, Consultant, SIDHA

The cost of the proposed 10 year Site Specific Wildlife Management Plan with respect to the activities to be carried out by DFO, Chatra South Forest Division has been estimated to be Rs 4836.34 lakh and for DFO Hazaribagh Wildlife Division estimated to be Rs. 2352.66 lakh. The summary of the proposed interventions (component wise) under the Plan with the objective of conservation of forest and wildlife resources as also to mitigate the impacts of mining on forests and wildlife is as follows

Summary of the Wildlife Management Plan for Magadh OCP

Sl no	Component	Proposed budget in lakh INR		
		Chatra South Div	Hazaribag Wildlife Div	Total
1	Biodiversity Enhancement	1919.48	856.00	2775.48
2	Measures for forest protection, anti-depredation and wildlife protection	316.50	0.00	316.50
3	Capacity building and procurement of anti-depredation items	226.65	477.25	703.90
4	Fire prevention and protection of habitat	251.55	140.50	392.05
5	Capacity building to local people in fringe villages	291.00	122.00	413.00
6	Capacity building of forest department for implementing, monitoring and supervision of plan	386.00	334.80	720.80
7	GIS and remote sensing for implementation and monitoring	121.00	0.00	121.00

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

8	Awareness promotion about Medicinal Plants and protection of endangered species.	318.10	30.00	348.10
9	Corpus Fund	100.00	0.00	100.00
10	Contingency amount	100.00	0.00	100.00
11	Cost Escalation @ 20%	806.06	392.11	1198.17
	Grand Total:-	**4836.34**	**2352.66**	**7189.00**

The Plan with a total financial outlay of Rs. 7189.00 Lakh extends over a period of 10 years from the first year of implementation (Year 2023-24 to 2032-33; tentatively) shall be utilized by the Forest Department through the DFO, Chatra South Forest Division and Hazaribagh Wildlife Division in accordance with the Plan prescriptions. Amount of Rs 7189.00 Lakhs of SSWMP shall be deposited by the User Agency.

Considering the proposals under the plan, sanction is hereby accorded to the instant Plan subject to the following conditions:

(i) That the User Agency shall ensure that its officials/contractors and the work force engaged into mining and allied operations under the Project shall not commit or abet any forest/wildlife offence in their area of operation. They will also promptly report any forest/wildlife offence in the area to the nearest forest office/official. Further, they will extend their full cooperation to the forest officials in control/mitigation of any incident, natural or man -made, detrimental to forest and wildlife in their area of operation.

(ii) ***That the total amount of Rs 7189.00 lakh shall be deposited by the User Agency into CAMPA account under the relevant head/sub-head and shall be utilized by the State Forest Department through the DFO,*** **Chatra South Forest Division/ DFO Hazaribagh Wildlife Division,** ***as delineated under the Plan, strictly in accordance with the prevailing norms under the Jharkhand Forest Department.***

(iii) That as regards the funds earmarked against activities to be undertaken by the State Forest Department, DFO, Chatra South Forest Division/ DFO Hazaribagh Wildlife Division shall prepare a detailed Annual Plan of Operations (APO) in the beginning of every financial year in respect of the instant Plan following all the rules, regulations, Schedule of Rates etc. issued from time to time by the State Government/ Forest Department, Regional Chief Conservator of Forests, Hazaribagh/ Chief Conservator of Forests, Wildlife, Ranchi shall supervise & closely monitor the progress of the activities undertaken by Divisional Forest Officer, Chatra South Forest Division / Hazaribagh Wildlife Division as per the approved APO & funds released under CAMPA.

(iv) That the Conservator of Forests, Chatra Circle shall supervise all the activities as per directions issued by the Forest Department from time to time.

(v) That the DFO, Chatra South Forest Division / DFO Hazaribagh Wildlife Division shall carry out the activities under the Plan strictly as per the duly sanctioned APO.

(vi) That the DFO, Chatra South Division / DFO Hazaribagh Wildlife Division shall ensure that no violation of duly sanctioned Working Plan of Chatra South Forest Division/Management Plan of Wildlife Sanctuary takes place during implementation of any of the activities involved in this plan over notified and demarcated forest land

01.12.23

SADALA SATYANARAYAN
Project Officer
Magadh OCP

(vii) That at least one year before the expiry of the instant Plan the User Agency shall formulate and submit to the Forest Department another plan in continuation of the instant plan for next 10 years. The impact of implementation of this Plan shall be evaluated by the competent authority.

(viii) That the instant Plan is dynamic and may be revisited after every 2 years and a revised plan may be formulated as per need of the project impacted area and convenience of the implementing agencies. The revised plan, if any, shall be put up before the Principal Chief Conservator of Forests, Wildlife & Chief Wildlife Warden, Jharkhand for its due approval.

(ix) That though adequate provisions have been made towards cost escalation in the plan viz. increase in wage rate/ material cost etc., yet the User Agency shall submit an undertaking to the Divisional Forest Officer, Chatra South Forest Division to the effect that they will deposit extra cost of the plan beyond the cost escalation provision owing to increase in wage rate etc. in due course of time as well as consequent upon revision in the plan, if any, as and when given effect to by the competent authority.

Sd/-
Principal Chief Conservator of Forests
Wildlife and Chief Wildlife Warden, Jharkhand

Memo No. **Dated:**

Copy forwarded to Deputy Director General of Forests (Central), Ministry of Environment, Forests and Climate Change, Integrated Regional Office, Harmu Housing Colony, Ranchi [E-mail: ro.ranchi-mef*a* gov in] for information and necessary action.

Sd -
Principal Chief Conservator of Forests
Wildlife and Chief Wildlife Warden, Jharkhand

Memo No. **Dated:**

Copy forwarded to Additional Chief Secretary, Department of Forests, Environment and Climate Change, Govt. of Jharkhand Ranchi Principal Chief Conservator of Forests, Jharkhand, Ranchi Principal Chief Conservator of Forests-cum-Executive Director, Wasteland Development Board, Jharkhand, Ranchi for Information.

Sd -
Principal Chief Conservator of Forests
Wildlife and Chief Wildlife Warden, Jharkhand

Memo No. **Dated:**

Copy forwarded to Additional Principal Chief Conservator of Forests, CAMPA, Jharkhand, Ranchi with a copy of plan for Information and necessary action.

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

Sd -
Principal Chief Conservator of Forests
Wildlife and Chief Wildlife Warden, Jharkhand

Memo No. **Dated:**

Copy forwarded to Regional Chief Conservator of Forests, Hazaribagh/ Chief Conservator of Forests, Wildlife, Jharkhand, Ranchi/ Conservator of Forests, Chatra Circle/ Divisional Forest Officer, Chatra South Forest Division/ Divisional Forest Officer, Hazaribagh Wildlife Division for information and necessary action.

Sd/-
Principal Chief Conservator of Forests
Wildlife and Chief Wildlife Warden, Jharkhand

Memo No. 1473 **Dated:** 29/11/2023

Copy forwarded to Sri Nirpendra Nath, General Manager, Magadh OCP, Magadh Sanghmitra Area, CCL [E-mail gmmgseel@gmail.com pomagadhms@gmail.com for information and necessary action.

29/11/23
Principal Chief Conservator of Forests
Wildlife and Chief Wildlife Warden, Jharkhand

01.12.23
SADALA SATYANARAYAN
Project Officer
Magadh OCP

ANNEXURE-31

CENTRAL COALFIELDS LIMITED
(A Subsidiary of Coal India Limited)
(A Govt. of India Undertaking)
OFFICE OF THE PROJECT OFFICER
MAGADH OCP,
MAGADH-SANGHMITRA AREA
E-mail ID: pomagadhms@gmail.com

CCL
(A miniratna category-I company)

Undertaking To Bear the Cost of Implementation of Wild Life Management Plan

Magadh OCP, M-S Area, CCL undertakes to bear the cost of implementation of approved Wild Life Management Plan to Forest Department.

01/12/23

Project Officer
Magadh OCP

SADALA SATYANARAYAN
Project Officer
Magadh OCP