कार्यालय : प्रधान मुख्य वन संरक्षक, वन्य प्राणी एवं मुख्य वन्य प्राणी प्रतिपालक, झारखण्ड, रांची।

Email : pccfwljhk@jharkhandmail.gov.in Phone No. 0651-2481744

पत्रांक..... दिनांक.....

सेवा में,

अपर मुख्य सचिव,
वन, पर्यावरण एवं जलवायु परिवर्तन विभाग,
झारखण्ड, रॉची।

विषयः– **Wild Life Conservation Plan in respect of Tubed Coal mine.**

प्रसंगः– **दामोदर घाटी निगम, डी0भी0सी0 टावर, भी0आई0पी0 रोड, कोलकाता का पत्रांक No. HQ/Mining/Tubed/WildLife/248 दिनांक 06.04.2018, इस कार्यालय का पत्रांक 977 दिनांक 05.09.2012 एवं भारत सरकार का आवंटन आदेश संख्या 103/04/2016/NA दिनांक 07.10.2016**

महाशय,

उपर्युक्त विषयक प्रासंगिक पत्रों (छायाप्रति संलग्न) के क्रम में दामोदर घाटी निगम के प्रासंगिक पत्र के माध्यम से सूचित किया गया है कि मेसर्स तुबेद कोल माईन्स लिमिटेड को आवंटित की गयी कोयला खदान जो लातेहार वन प्रमण्डल के अधीन पडता है को दामोदर घाटी निगम के नाम से भारत सरकार के द्वारा Allotment Order bearing No 103/04/2016/NA dated 07-10-2016 के द्वारा आवंटित किया गया है।

अधोहस्ताक्षरी के कार्यालय पत्रांक 977 दिनांक 09.05.2012 के द्वारा सचिव, वन एवं पर्यावरण विभाग, झारखण्ड को मेसर्स तुबेद कोल माईन्स लिमिटेड के द्वारा समर्पित वन्यप्राणी (संरक्षण) प्रबंधन योजना को अनुमोदनोपरान्त अग्रेतर कार्रवाई हेतु प्रेषित किया गया था।

दामोदर घाटी निगम द्वारा प्रासंगिक पत्र के माध्यम से अनुरोध किया गया है कि पूर्व में मेसर्स तुबेद कोल माईन्स लिमिटेड के द्वारा समर्पित की गयी वन्यप्राणी (संरक्षण) प्रबंधन योजना में लगाये गये सभी शर्तों का अनुपालन अक्षरशः किया जायेगा।

अतः अनुरोध है कि उक्त वन्यप्राणी (संरक्षण) प्रबंधन योजना को ही सैद्वान्तिक रूप से दामोदर घाटी निगम के नाम से परिवर्तित करते हुये अग्रेतर कार्रवाई करने की कृपा की जाये बशर्ते वर्ष 2018 की दरो पर इस योजना को संशोधित कर दामोदर घाटी निगम द्वारा राशि उपलब्ध कराई जाये।

अनुलग्नकः– यथोक्त।

आपका विश्वासी
ह0/–
प्रधान मुख्य वन संरक्षक,
वन्य प्राणी एवं मुख्य वन्य प्राणी प्रतिपालक,
झारखण्ड, रांची।

मोहन जी / Mohan Jha
मुख्य अभियंता (खनन) / Chief Engineer (Mining)
दामोदर घाटी निगम / Damodar Valley Corpn.
डी.वी.सी. टावर्स, वी. आई. पी. रोड, कोलकाता-54
DVC Towers, VIP Road, Kolkata-54

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ज्ञापांक 911 दिनांक 23/05/18

प्रतिलिपिः— Chief Engineer – 1 (Mining) Damodar Valley Corporation DVCTowers. VIP Road Kolkata-700054 को उनके पत्रांक नं0— HQ/Mining/Tubed/Wildlife / 248 दिनांक 06.04.2018 के क्रम में सूचनार्थ प्रेषित।

प्रधान मुख्य वन संरक्षक,
वन्य प्राणी एवं मुख्य वन्यप्राणी प्रतिपालक,
23/05/18 झारखण्ड, रांची।

मुख्य अभियंता (खनन) / Chief Engineer (Mining)
दामोदर घाटी निगम / Damodar Valley Corpn.
डी.वी.सी. टावर्स, वी. आई. पी. रोड, कोलकाता-54
DVC Towers, V.I.P. Road Kolkata-54

D:/mantu/letters

कार्यालय : प्रधान मुख्य वन संरक्षक, जैव विविधता संरक्षण एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, राँची ।

पत्र संख्या :– 977 राँची, दिनांक 5/9/12

सेवा में,

सचिव,
वन एवं पर्यावरण विभाग,
झारखण्ड।

(17)

विषय – मेसर्स तुबेद कोल माईन्स लि0 के द्वारा समर्पित वन्य प्राणी संरक्षण एवं प्रबंधन योजना के अनुमोदन के संबंध में।

प्रसंग – वन एवं पर्यावरण विभाग के पत्रांक 4017, दिनांक 28.10.2010

महाशय,

उपर्युक्त विषय पर सरकार के प्रसंगाधीन पत्र के संदर्भ में बिन्दुवार प्रतिवेदन निम्नवत् है :–

1. योजना के सभी पृष्ठों पर कम्पनी के Authorised Signatory के द्वारा हस्ताक्षर कर दिया गया है । (योजना की दो प्रतियां संलग्न है)
2. उक्त पत्र प्राप्ति के पश्चात् पूर्व समर्पित योजना काअधोहस्ताक्षरी द्वारा दोबारा गहन रूप से अध्ययन किया गया। अध्ययनोपरान्त यह पाया गया कि पूर्व में इस कार्यालय के पत्रांक 442, दिनांक 01.09.2010 द्वारा समर्पित वन्य प्राणी संरक्षण एवं प्रबंधन योजना के अनुसार Wildlife and Habitat पर पड़ने वाले Adverse Impacts को mitigate करने हेतु जितनी राशि की योजना बनाई गई थी उसपर प्रतिवर्ष प्रस्तावित खर्च मात्र 27.00 लाख रूपये की दर से दस वर्षो के लिये 270.00 लाख रूपये था, जो कि काफी कम एवं Inadequate था। इस पर कार्रवाई करते हुए इस योजना को पुनरीक्षित कर कुछ नये Items जोड़े गये तथा कुछ पूर्व के Items की Frequency बढ़ाई गई। ऐसा करने से योजना की राशि 468.90 लाख रूपये की हो गयी, जिसे प्रयोक्ता अभिकरण को इस कार्यालय के पत्रांक 815 दिनांक 25.07.2012 द्वारा (छाया प्रति संलग्न) भेज कर Recast की गयी योजना पर सहमति तथा उक्त राशि उपलब्ध कराने हेतु लिखित. सहमति प्रयोक्ता अभिकरण के पत्रांक 523, दिनांक 26.07.2012 द्वारा प्राप्त की गई। (छायाप्रति संलग्न)
3. कम्पनी द्वारा अपने नये CEO के संबंध में दी गयी बचनबधता (undertaking) एवं उनके पक्ष में दी गयी Power of Attorney की छायाप्रति संलग्न की जा रही है।
4. वन्य प्राणी संरक्षण एवं प्रबंधन योजना में प्रस्तावित राशि भारत सरकार से वन संरक्षण अधिनियम के अन्तर्गत stage-I की स्वीकृति प्राप्त होने के उपरान्त कम्पनी द्वारा एक मुस्त में वन प्रमंडल पदाधिकारी, लातेहार वन प्रमंडल को उपलब्ध करायी जायेगी, जो कि इस राशि को राष्ट्रीयकृत बैंक (Nationalised

TUBED COAL MINES LIMITED
TCML

E:\...\documents\letters\letter August 2012

मोहन झा / Mohan Jha
मुख्य अभियंता (खनन) / Chief Engineer (Mining)
दामोदर घाटी निगम / Damodar Valley Corpn.
डी.वी.सी. टावर्स, वी. आई. पी. रोड, कोलकाता-54
DVC Towers, VIP Road, Kolkata-54

Bank) में रखेंगे तथा योजना का कार्यान्वयन मुख्य वन्य प्राणी प्रतिपालक, झारखण्ड से स्वीकृति प्राप्त कर उनके मार्गदर्शन में करेंगे।

5. वन्य प्राणी प्रबंधन योजना भारत सरकार के दिशा निर्देश के अनुरूप है।
6. विषयगत परियोजना से संबंधित वन भूमि अपयोजन का प्रस्ताव प्रधान मुख्य वन संरक्षक, झारखण्ड के पत्रांक 1566, दिनांक 19.04.2012 द्वारा सरकार को प्रेषित किया जा चुका है जिसकी प्रति इस कार्यालय को भी ज्ञापित है।
7. वन प्रमंडल पदाधिकारी, लातेहार प्रमंडल के पत्रांक 2084, दिनांक 28.08.2012 द्वारा दी गई सूचना के अनुसार बेतला राष्ट्रीय उद्यान से लातेहार वन प्रमंडल अन्तर्गत प्रस्तावित परियोजना स्थल (तुबेद कोल माईन्स) की दूरी 21 कि0मी0 है। उनके द्वारा इस सूचना को नक्शे पर दर्शाते हुए इस आशय का प्रमाण पत्र भी दिया है जो की इस पत्र के साथ भेजा जा रहा हैं।
8. भारत सरकार, पर्यावरण एवं वन मंत्रालय में वन भूमि अपयोजन तथा पर्यावरणीय स्वीकृति संबंधी कार्रवाई दो अलग–अलग संभागों (wings) द्वारा की जाती है तथा किसी भी परियोजना पर कार्य सभी प्रकार की स्वीकृति प्राप्त हो जाने के पश्चात् ही प्रारम्भ किया जाता है।

उक्त सूचना सरकार के प्रसंगाधीन पत्र के उत्तर मात्र में दी जा रही है क्योंकि इस संबंध में कार्रवाई मेरे योगदान के पूर्व ही की जा चुकी है। वांछित सूचना के आलोक में विषयगत प्रस्ताव पर सरकार के स्तर पर अग्रेतर कार्रवाई करने के संबंध में उचित निर्णय लेना चाहेंगे।

अनु0–यथोक्त।

विश्वासभाजन

4/9/12

प्रधान मुख्य वन संरक्षक
एवं जैव विविधता संरक्षण एवं मुख्य वन्य प्राणी प्रतिपालक,
झारखण्ड, राँची ।

4/9/12

4/9

Mohan Jha
मुख्य अभियंता (खनन) / Chief Engineer (Mining)
दामोदर घाटी निगम / Damodar Valley Corpn.
डी.वी.सी. टावर्स, वी. आई. पी. रोड, कोलकाता-54
DVC Towers, VIP Road, Kolkata-54

TUBED COAL MINES LIMITED
TCML
A JOINT VENTURE OF HINDALCO Industries Ltd.

Office of the Principal Chief Conservator of Forests, Biodiversity Conservation -Cum- Chief Wildlife Warden, Jharkhand, Ranchi.

No. 215 Ranchi, Dated 25/7/2012

To,

Sri Lakshmi Narayan
CEO
Tubed Coal Mines
Aurunga Coalfield,
Latehar.

Sub.: Approval of the Wildlife Conservation Plan for obtaining Wildlife clearance of Tubed Coal Mines.

Sir,

Kindly refer to your letter TCML/2010-11/WCP/175 dated 18.08.2010 vide which you had submitted Wildlife Conservation Plan of Tubed Open Cast Coal Mine, Aurunga Coalfield, dist. Latehar in the Latehar Range of the Latehar Forest Division. Prepared by Sri. P.K. Sen (retd. IFS officer) for the approval by the undersigned.

The same was submitted to the Jharkhand Govt. vide this letter No. 442 dated 01.09.2010 for further necessary action under intimation to you. Thereafter the Jharkhand Govt. in the Deptt. of Forest & Environment have made some queries one of which relates to the suitability and viability of the Mangement Plan. With a view to comply the query raised by Govt. of Jharkhand, it was felt necessary to revisit the Wildlife Management Plan and scrutiniz the same from the point view its suitability and adequacy.

As a result of this the original cost out lays for mitigating the adverse impacts on the Wildlife which were for the rupees 270.00 lacs for ten years has to be upwardly revised to the tune of rupees 469.00 lacs for ten years. This has happened as a result of introduction of some additional mitigating measures and also because of increasing the quantity of measures envisaged earlier.

A revised detailed sheet giving the various items of the work along with the cost thereof for ten years (10 years) from 2012-13 to 2021-22 (which will

TUBED COAL MINES LIMITED [A JV of HINDALCO & TATA Power Company] TCML

मुख्य अभियंता (खनन) / Chief Engineer (Mining)
दामोदर घाटी निगम / Damodar Valley Corpn.
डी.वी.सी. टावर्स, वी. आइ. पी. रोड, कोलकाता-54
DVC Towers, VIP Road, Kolkata-54

automatically get revised from the date of approval of projects for subsequent ten years) is being enclosed herewith for your approval and acceptance.

Another query from the Jharkhand Govt. relates to the submission of proper authorization by the company in favour of the person signing the various documents.

You are therefore requested to kindly comply the above to enable this office to submit a suitable recommendation to the department of Forest & Environment, Govt. of Jharkhand.

Enclosures – As above

Your's Sincerly,

25/7/12

Principal Chief Conservator of Forests ,
Biodiversity Conservation – cum – Chief Wildlife Warden,
Jharkhand, Ranchi.

25/7/12

मोहन झा / Mohan Jha
मुख्य अभियंता (खनन)/Chief Engineer (Mining)
दामोदर घाटी निगम / Damodar Valley Corpn.
डी.वी.सी. टावर्स. वी. आई. पी. रोड, कोलकाता-54
DVC Towers. VIP Road, Kolkata-54

TUBED COAL MINES LIMITED
(A JV of HINDALCO Industries Ltd. & The TATA Power Company)
TCML

Proposed Budgetary Provision for Wildlife Management Plan

A. The following table gives the item-wise cost estimates for different activates within the study area. This will be the addition to provisions made in the environment manage mental plan and corporate social responsibiles.

B. The total cost of the proposed plan is Rs. 469.00 Lacs.

C. Items-wise abstract of the plan are as follows :-

Sl. No.	Item	Financial outlay (in lacs)
1	Habitat improvement	323.00
2	Fire protection	21.50
3	Consolidation of forest boundary	5.40
4	Mitigation measure to reduce Man Animal confiict	19.00
5	Training and awareness	2.00
6	Socio-economic Development activities	94.00
7	Miscellaneous	4.00
	Total	468.90 or 469.00

Or say four hundred sixty nine lacs only.

D. The plan shall be totally funded by M/s Tubed coal mines Ltd. and will be implemented by the latehar Forest division in the study area.

E. Items where physical & financial targets have been given the physical targets will have the overriding priority where the financial targets will have to be upwardly revised necessitated due to the increase in rate of materials and wages.

मोहन झा / Mohan Jha
मुख्य अभियंता (खनन)/Chief Engineer (Mining)
दामोदर घाटी निगम /Damodar Valley Corpn.
डी.वी.सी. टावर्स, वी. आई. पी. रोड, कोलकाता-54
DVC Towers, VIP Road, Kolkata-54

TUBED COAL MINES LIMITED
TCML
(A Joint Venture of HINDALCO Industries Ltd. & The TATA Power Company Ltd.)

Item of work	Annual Physical and Financial Target (Rs in lakh)																				Total for 10 years	
	2012-13		2013-14		2014-15		2015-16		2016-17		2017-18		2018-19		2019-20		2020-21		2021-22			
	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
itat Improvement																						
iboo plantation (including ntenance charge)	50 ha	11	50 ha	11	50 ha	11	50 ha	11	50 ha	11	50 ha	11	50 ha	11	50 ha	11	50 ha	11	50 ha	11	500ha	110.00
F Plantation	25ha	14	25ha	14	25ha	14	25ha	14	25ha	14	25ha	14	25ha	14	25ha	14	25ha	14	25ha	14	250ha	140.00
struction of ponds 'x100x10'	1	4.00	1	4.00	1	4.00	1	4.00	1	4.00	1	4.00	1	4.00							7	28.00
struction of pacca check dam r stone packing on both sids	1	5.00			1	5.00			1	5.00	1.00	5.00			1	5.00					5	25.00
struction of Kachcha check and brush wood Check dam	L.S	2.00	L.S	2.00	L.S	2.00	L.S	2.00	L.S	2.00	L.S	2.00	L.S	2.00	L.S	2.00	L.S	2.00	L.S	2.00	L.S	20.00
Protection																						
line cutting and controlled ning along in mining area	L.S	0.25	L.S	0.25	L.S	0.25	L.S	0.25	L.S	0.25	L.S	0.25	L.S	0.25	L.S	0.25	L.S	0.25	L.S	0.25	L.S	2.50
protection through J.F.M mittee.	L.S	0.15	L.S	0.15	L.S	0.15	L.S	0.15	L.S	0.15	L.S	0.15	L.S	0.15	L.S	0.15	L.S	0.15	L.S	0.15	L.S	1.50
fighting tools and other kits	L.S	3.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	L.S	3.00
struction of watch tower	1	4.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	4.50
hase of one four wheeler cle for patrolling, raid and ire.	1	7.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	7.00
and maintenance cost of cle.	L.S	0.30	L.S	0.30	L.S	0.30	L.S	0.30	L.S	0.30	L.S	0.30	L.S	0.30	L.S	0.30	L.S	0.30	L.S	0.30	L.S	3.00
solidation of boundary with C. Piller	100 No	0.90	100 No	0.90	100 No	0.90	100 No	0.90	100 No	0.90	100 NO	0.90	-	-	-	-	-	-	-	-	600	5.40
gation measurs of reduce man-animal conflict																						
ision of solar street light for ers.	10	1.20	10	1.20	10	1.20	10	1.20	10	1.20	10	1.20	10	1.20	10	1.20	10	1.20	10	1.20	100	12.00

ere physical & financial targets have been given the physical targets will have the overriding priority whereas financial targets will have to be upwardly revised necessitated due to the increase in rate of wages/materials

establishment\Annual plan&at and financial target

Yours sincerely,

Pratap Sarkar

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e and distribution of solar , solar cooker and ess chulha.	20	0.50	20	0.50	20	0.50	20	0.50	20	0.50	20	0.50	20	0.50	20	0.50	20	0.50	20	0.50	200	5.00
ution of k. oil, crackers etc.	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	2.00
g and awareness																						
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ures, folder, pamphlet, s etc	LS	0.10	LS	0.10	LS	0.10	LS	0.10	LS	0.10	LS	0.10	LS	0.10	LS	0.10	LS	0.10	LS	0.10	Ls	1.00
economic development ies																						
n health care camp	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	5.00
ion of medical kit in ent villages	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	0.20	LS	2.00
ling drinking water facility l Pump	3	1.50	3	1.50	3	1.50	3	1.50	3	1.50	3	1.50	3	1.50	3	1.50	3	1.50	3	1.50	30	15.00
g of wells	2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	20	20.00
inar health care camp	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	3.00
ne generation scheme like ry, bee keeping, duckery, sewing mushroom and able cultivation etc.	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	1.00	LS	10.00
ir and renovation of existing	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	3.00
based training to SHG bers on the technical aspect	LS	0.80	LS	0.80	LS	0.80	LS	0.80	LS	0.80	LS	0.80	LS	0.80	LS	0.80	LS	0.80	LS	0.80	LS	8.00
truction of additional rooms hool.	LS	2.00	-	-	LS	2.00	-	-	LS	2.00	-	-	LS	2.00	-	-	LS	2.00	-	-	LS	10.00
ibution of educational books hool children	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	0.30	LS	3.00
cation facilities in the project ge within 5 kms.	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	0.50	LS	5.00
structionof community hall	1	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	10.00

ere physical & financial targets have been given the physical targets will have the overriding priority where the financial targets will have to be upwardly revised necessitated due to the increase in rate of wages/materials

\establishment\Annual physical and financial target

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ıneous																						L.S	2.00
cover monitoring through ation maps of BZ	L.S	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	L.S	2.00
eseen and misc iditure	L.S	2.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		468.90
Total		77.70		42.00		49.20		42.00		49.20		47.00		43.30		42.10		39.30		37.10			

re physical & financial targets have been given the physical targets will have the overriding priority where the financial targets will have to be upwardly revised necessitated due to the increase in rate of wages/materials

TUBED COAL MINES LIMITED (A JV of HINDALCO Industries Ltd. & The TATA Power Company) TCML

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कार्यालय प्रधान मुख्य वन संरक्षक, जैव विविधता संरक्षण एवं मुख्य वन्यप्राणी प्रतिपालक, झारखण्ड, राँची ।

पत्र संख्या :– दिनाक, अगस्त, 2010 ई0

सेवा में,

प्रधान सचिव,
वन एवं पर्यावरण विभाग,
झारखण्ड सरकार, राँची।

विषय :– सर्वश्री Tubed Coal Mines Limited द्वारा समर्पित "वन्य प्राणी संरक्षण एवं प्रबधन योजना" के अनुमोदन के संबंध में।

महाशय,

उपरोक्त विषय के संबंध में सूचित करना हैं कि प्रस्तावित तुबेद कोल खनन परियोजना, लातेहार वनप्रमण्डल में अवस्थित है, जिसका कुल रकवा 460 हे0 है। जिसमें 162.394 हे0 वनभूमि सम्मिलित है। संबंधित परियोजना हेतु पर्यावरण एवं वन मत्रालय, भारत सरकार के पत्रांक–J-11015/70/2009-1A-11(M)] दिनांक 30.04.09 (छाया प्रतिसंलग्न) द्वारा पर्यावरणीय स्वीकृति के क्रम मे टी0ओ0आर0 निर्गत की गई थी। उक्त टी0ओ0आर0 की शर्त संख्या XVI एवं XXXIII के अनुपालन के क्रम में प्रयोक्ता अभिकरण ने वन्य प्राणी संरक्षण योजना अनुमोदनार्थ समर्पित की है, जिसकी प्रति इस पत्र के साथ संलग्न भेजी जा रही है।

प्रयोक्ता अभिकरण से प्राप्त वन्य प्राणी संरक्षण योजना में वन्य प्राणी प्रबंधन के उद्देश्य से nabitat improvement, soil and water conservation measure, research and monitoring awareness programme, fire protection, infrastructure development, eco-development activities, इत्यादि कार्य इकाईयों को शामिल किया गया है, जो प्रस्तावित खनन परियोजना से Study Area के Flora and Fauna पर पड़ने वाले प्रतिकूल प्रभाव को Mitigate करने के उद्देश्य से यथेष्ट हैं। प्रयोक्ता अभिकरण से प्राप्त वन्य प्राणी संरक्षण योजना तकनीकी रूप से स्वीकार करने योग्य है।

प्रस्तावित 10 (दस) वर्षीय वन्य प्राणी प्रबंधन योजना का वित्तीय लक्ष्य रू0 270.00 लाख है। प्रयोक्ता अभिकरण ने Eco-development Activities हेतु कर्णांकित रू0 90.00 लाख से संबंधित कार्य अपने संसाधनों से एवं शेष रू0 180.00 लाख का कार्य वन विभाग के माध्यम से कराने का प्रस्ताव दिया है जिसे स्वीकार किया जा सकता है।

प्रयोक्ता अभिकरण ने संबंधित योजना के क्रियान्वयन हेतु वित्त पोषण की वचनबद्धता समर्पित की है, जो समर्पित योजना के पृष्ठ संख्या 54 पर रक्षित है।

अनुरोध है कि उपरोक्त वर्णित तथ्यों के आलोक में सर्वश्री Tubed Coal Mines Limited से प्राप्त वन्य प्राणी संरक्षण योजना की स्वीकृति के संबंध में निर्णय लेते हुए भारत सरकार को निर्णय से अवगत कराने की कृपा की जाय।

अनु0:यथोक्त।

आपका विश्वासी
ह0/
प्रधान मुख्य वन सरक्षक
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WILDLIFE CONSERVATION PLAN

Tubed Open Cast Coal Mine

(Auranga Coalfield, District – Latehar)

Latehar Forest Division

Latehar Range

JHARKHAND STATE

AREA: 460 HECTARES

Prepared by:

P.K. Sen, IFS (Ex. Chief Wild Life Warden, JHARKHAND)

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CHAPTER – I

1.1 INTRODUCTION

Erstwhile district of Palamu has been divided into three districts prior to and after reorganization of the state of Jharkhand. The districts are Palamu, Latehar and Garhwa. All these three districts were not famous for coal mines except for small pockets like Garhwa having coal field in Rajahara, Palamu in Barwadih and Latehar in Sikni. Barwadih being in the fringes of Palamu Tiger Reserve was not given clearance for extension of mines. Sikni in Latehar was worked by Bihar State Mineral Development Corporation, now Jharkhand State Mineral Development Corporation. The Rajhara Coal Field is larger in size and being worked by Coal India Limited. Extensive survey of mining potential of course has found new coal seams and Tubed Coal Mines is one of them.

India has borrowed technical expertise from Australia and tried to mine the coal fields with superior technology and mechanization, therefore even the coal bearing areas not previously viable commercially are being worked now.

1.2 Latehar Forest Division at a Glance

1.2.1 CLIMATE

The climate of the area according to Lang's factors (56) is sub-humid, is characterized by three distinct climatic seasons namely summer, rainy and winter with mean annual temperature of 25.6^0 C and with mean annual rainfall of 1127mm. The hottest months are May and June and the coolest months are December and January.

1.2.2 SEASONS

There are usually three climatic seasons, viz. the cold weather, the hot weather and the rains. Cold weather sets in November and lasts till March of the following year. Severe effects of cold weather are noticed at times in valleys and along river banks with the occurrence of 'frost' and 'fog'. The hot months are April to June. The blistering "45 degree to 48 degree" temperature of Palamu district, next only to Gaya, is notorious throughout the state. The rainy season is

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therefore most welcome after the summer. It starts raining from about the end of June. There is a short period of rainfall during the month of January as well which is very beneficial to the rabbi crop from health point of view. Latehar Division is climatically quite congenial throughout the year except for summer.

1.2.3 RAINFALL

The rainfall varies greatly according to the locality and sometimes from year to year. It is heavier in July and August. Occasional showers continue till September – October. There is a little rain in January also though sometimes there is absolutely no winter rains. Erratic and fluctuating rains often cause drought in the district of Latehar. The district has now been declared a chronic drought affected area and special measures are being taken under centrally sponsored schemes of D.P.A.P. to improve the situation. Normally the rainfall varies between 900mm -1000 mm in a normal monsoon year. It has been observed that the cycle of low rainfall is once in 4 years.

1.2.4 TEMPERATURE

The temperature also varies greatly according to locality. The mean daily maximum and minimum temperature as recorded at Daltonganj and furnished by the Director, Regional Meteorological Centre, Kolkata. During winter it varies between 10 degrees to 20 degrees Celsius. However in the night it can go down to as low as 5 degrees in the last fortnight of December and first fortnight of January. The summer in May and June can reach 48 degree Celsius during mid day.

1.2.5 W I N D

Winds of high velocity are unusual but minor cyclones and occasional thunder storms do occur during May and June and sometimes in February and March. During the hot weather high dry westerly wind known as 'Lohar' causes desiccation of soil and proves a great impediment to the success of plantations. The hot wind blows from the west, during 9 A.M. to 5p.m. High winds laden with dust and fine sands are common features during the summer.

1.2.6 WATER SUPPLY

The Division is only moderately supplied with perennial rivers and springs. The forest areas are strictly speaking deficient in water supply beyond the rainy seasons. Generally, all the streams

and rivers begin to dry up shortly after the rainy months. During April & May, even the big rivers like the Auranga and Damodar look more or less like sands of desert rather than courses of water. Drinking water generally gets scarce during summer months and when there is a prolonged hot spell, real misery about drinking water is experienced over most of the places.

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1.2.7 NATURAL CALAMITIES

Serious natural calamities are not common. Damage by flood is unknown in the area. Storms are local and do not cause any appreciable damage.

1.2.8 AREA DISTRIBUTION OF FOREST IN LATEHAR FOREST DIVISION

Out of the total land area of 2698.86 sq. K.M. of the Latehar Forest Division only about 1309.64sq K.M. are occupied by forests constituting only about 48.41 percentage of the land surface. The forests are more or less compact. The forests of Latehar Division comprise the Reserved forests, Khasmahal Reserved or Khalsa Reserved forests, old protected forests and the (new) protected forests as indicated below:-

The forests are more compact in the southern, northern and western portions of the divisions as compared to the eastern portion where these are very much scattered, dissected and bifurcated by both small and big villages. The forest vegetation as a consequence, gets inferior and thinner and less in value. The quality of forests is better in south of the Daltonganj - Ranchi Road.

The protected forests excluding those notified prior to the introduction of the B.P.F. Act were demarcated by the forest Department on the eve of and prior to their taking over, by the forest department during 1948 to 1950 and were shown on 16"=1 mile cadastral sheets, the entire (vested) protected forests of this division covers approximately 1,08,977.64 hectares which forms nearly 83% of the total forest area of the division and is distributed in different Ranges.

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1.3 OLD PROTECTED FORESTS

There are only five old protected forests which were notified as such, prior to the introduction of the B.P.F. Act and lie within the jurisdiction of the Latehar and Manika Ranges. The distribution of old Protected forest is as below:-

The Khalsa reserved forests or the Khasmhal Reserved forests are those forests which have been transferred from the civil Department to the forests Department. They are confined to only two ranges of this division, namely Latehar and Manika. All these K.R.F. forests are demarcated and the boundary

lines shown on 16"=1 mile cadastral maps. In all, there are 57 K.R.F.s out of which 41 K.R.F.s were notified and constituted as reserve forests, the remaining 16 were also constituted as Reserve forests.

The Reserved forests of Latehar Division are compact and very valuable. They are confined to only three ranges having a total forests area of 29,922.33 acres or 12,109.40 hectares only.

The analysis of the above forests shows that reserved forests are concentrated in Manika, Latehar and Richughuta Range only .Old PFs. And K.R.Fs. are only in Latehar and Manika ranges. Chandwa and Balumath ranges have only new protected forests. As all K.R.Fs. have been notified as R.Fs, and the word Khalsa has only historical importance. Boundaries of RFs. and P.Fs. are generally in straight lines while that of K.R.Fs. and P.Fs in Zigzag lines.

1.4 STATE OF THE BOUNDARIES

A special feature of the original demarcation of the Reserved and old protected forests , prior to the Bihar Private forests Act is that the boundaries are not very zig-zag and that reclaimed lands were excluded and did not form a pocket inside the forest limits. In most cases, however forests in varying extent were left out. Such forests were subsequently taken over under the Bihar private Forests Act. Subsequent upon the introduction of Land reforms Act.1952, these forests were constituted as Protected Forests. The forests thus taken over for management under the B.P.F. Act were very hurriedly demarcated resulting in serious mistakes which were subsequently rectified. The forest-land, however, has been released from time to time under the instructions received from Government leading to the instability of the boundary lines before 1980. Now this process has stopped with the introduction of the Forests (Conservation) Act 1980.

Note: With the promulgation of Forest Rights Act 2006 it is expected that more of these forests will be owned by Tribals and other Forest Dwellers when the ownership is bestowed on them.

1.5 MAINTENANCE OF BOUNDARIES

Boundary pillars are neither checked nor maintained in any regular way. As a result they are in unsatisfactory condition wherever there is pressure for one and particularly in the vicinity of highly populated villages. Area has, however, been planted along the boundary lines and around the boundary pillars in many cases, At least annually pillars must be checked and maintained to be deleted. The system of terms fencing in plantations has left practically much of the Zig-Zag area out of forests to be encroached. The revision survey has brought the extent of encroachment to light and around 2% of the total forests area is under illegal occupations.

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1.6 LEGAL POSITION

The majority of the reserved forests were constituted in 1877 under the I.F. Act of 1865 but they were re-notified under section 34 of the I.F. Act, 1878. The remaining Reserved Forests were gazetted subsequently under section 19 of the 1878 Act or section20 of the Indian forests Act 1927. Some of these forests were Government owned while others belonged to the Zamindars which were taken over U/S 38 of the I.F. Act, 1927.

With the vesting of the Zamindaris under the L.R. Act all the Private Protected forests were declared Protected Forests under the Provisions of the Indian forests Act, 1927.

1.7 RIGHTS AND CONCESSIONS

1.7.1 RESERVED FORESTS

The Reserved forests constituted prior to 1923 were gazetted and free of rights. Some privileges and concessions which were granted to the Villagers are detailed below:-

a) The tenants of the Villages living in reserved forests are allowed to graze their cattle except sheep and goats free of charge subject to the restriction as may be closed to grazing by the Divisional forests officer for such period as he deems necessary.
b) To remove free of charge brush wood, grass and edible fruits from reserved areas.
c) Mahua Flowers may be collected without burning the leaves and grass under the trees and bamboo may be taken on application, free of cost for building houses and covering old roofs.

1.7.2 KHALSA R.F AND OLD PROTECTED FORESTS

The old protected forests and Khalsa Reserved forest are burdened with the general right prevailing in protected forest of Chotanagpur districts, subject to the limitations. The no right generally exists in respect of reserved trees over 3ft.in height and under 18"in girth. The forest settlement officers passed orders in the year 1946, allowing clearly the extent and nature of right and concessions to the tenants of different Khasmahal Villages. The villagers of these forests were allowed rights over various categories of forest produce with minor variations. They were allowed to take

(a) timber, poles for repairs of house and bonafide agriculture implements.

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(b) Take fencing materials (c) collect Mahua flowers, edible fruits and roots, (d) take firewood and pole for domestic use and for marriage and cremation purpose (e) rear lac and tassar cocoons for commercial purpose on payment of royalty.

1.7.3 NEW PROTECTED FORESTS (VESTED) UNDER L. R. ACT.

In respect of the protected forests (vested under L.R. Act) the rule is that government exercises the rights and concessions are more or less the same for every village, though the nature and number of rights allowed varied from village to village. The entries in Khatian Part- II recorded at the last revision of settlement have been adopted as the basis for ascertaining the extent and type of rights. In the record of rights in Khatian Part-II, the following rights in general have been admitted:-

(a) Right to take timber for the construction and repair of houses, cowsheds etc. and for agricultural implements.

(b) Take wood for fuel.

(c) Take dead and dry fallen trees.

(d) Graze cattle.

(e) Collect Mahua and other fruits and flowers.

(f) Take chope.

(g) Rear lac, and

(h) Take any other forest produce viz . bamboo etc.

1.7.4 CUSTOMARY RIGHTS

The nature of rights and concessions including the customary right to

(a) take Jhuri, Jhanti, Ghoran and headload of dry and fallen trees.

(b) Take wood for cremation purposes, and

(c) Right of way to a place of worship, a water point or through a cart track, whenever such demand arises.

Illicit felling, over grazing have diluted the concept of rights and concessions. Growth in human and cattle population has also accentuated the problem. The genuine right

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holders are deprived also due to migration. Irregular rain fall and periodic drought condition has also forced to graze migratory cattle in viable grazing lands. Photographs have been taken from different locations and angles which show the status of forests in the lease hold and the surrounding buffer area and beyond.

Most of the area is Sal rooted waste with isolated Sal pole crop, Blank, Rocky out crop and degraded and overgrazed blanks showing growth of Lantana, Butea, Vitex, Ipomea etc.

This Lease hold and the Buffer are bi-sected by a partially black top road and mainly fair weather road, leading to state highway which ultimately meets Latehar District Head Quarters on Ranchi - Daltonganj National Highway.

They also indicate poor vegetation in the entire area. Evidences of overgrazing, degraded grassland, devoid of large size trees due to illicit felling, hacking for small timber and leaves for feeding cattle, have resulted in complete absence of shelter wood thus making the area non-viable to harbor Fauna. Generally in such conditions poaching is rampant.

While surveying the area, complete absence of any ungulate have been observed therefore it is expected that the prescriptions in the Wildlife Conservation Plan will definitely improve the status of grassland, Flora and Fauna in future. Of course fund proposed for different activities for improvement of habitat has to be used properly and judiciously and monitored annually.

1.8 Agricultural crops

The region in which the study area is located falls in tropical zone. It is a hilly region with undulating landscape. **All the rivers/streams in the region are rain fed and hence seasonal.** Because of the climate and physical features of the area, the single cropping is practised in the area. Only monsoon crops are being raised in the area. Moreover, the soil tests in the area reveal that the soil has low fertility status. The area lacks irrigation facilities. Some farmers grow vegetables using tube-well irrigation.

1.9 Plantation Done by Forest Department

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Forest in the area has been exposed to great biotic pressures. Forest has been degraded. Local people have over exploited the forest for fuel wood, construction timber etc. Tribal population living in depends on forest resources.

Forest department has taken up afforestation work over the degraded patches of forest. They have used limited number of those species which require minimum maintenance and are least exposed to biotic pressure.

1.10 Natural vegetation in forest

The forest in the study area is tropical dry deciduous forest with Sal (Shorea, robusta), as the predominant species in association with Terminalia species like Asan, Arjun, Harra, Bahera, Adina, Kend, Butea monosperma (Palas) etc. These forests have been classified by Champion and Seth as peninsular dry deciduous Sal Forests 3 B. It is further sub divided to

Northern Dry Sal Forest ($5B/C_1$) and Northern dry mixed deciduous forest ($5B/C_2$) as per revised classification of forest types by Champion and Seth. Many miscellaneous species like Asan, Sidha, Pandan, Siris, Kendu, Salai, Dhaura, Jamun, Bijasal, Gamhar, in top canopy, Mahua, Bauhinia species, Bhelwa, Beri, Dudhkoraiya etc. in middle canopy are found. In under story Phuldhawai, Galphulli etc. are found. The common climbers are Mahulan, Latpalas and Arar.

These species normally support available population of wild life like jackal, deer, sambhar, barking dear, porcupine, wild boar etc.

1.11 Faunal study:

1.11.1 Avi & Terrestrial fauna

It has been stated earlier that the study area has been experiencing biotic pressure for a long time. These biotic pressures i.e. tree felling, encroachment of forest land for agriculture, industrialization and extension of human habitats has resulted into loss of forest cover. Because of such degradation, habitats for terrestrial fauna and avifauna have been affected. As the result of this, the population and diversity of terrestrial and avifauna have reduced considerably over the past.

1.11.2 Aquatic Fauna

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The river and streams flowing through the study area are inland and source of water in those rivers are precipitation in their catchments. As a result of this, all the streams are seasonal. Base flow in these rivers is contributed by ground water. Due to various reasons, ground water recharge has reduced in the area. As such, the base flow during the dry season has reduced. In these circumstances, these streams/nalas almost dry up during summer. Only a few puddles are seen. In the study area, there are only a few puddles even during rainy season. There is no large water body in the study area and even the puddles dry-up in summer.

In the circumstances as stated above, the diversity of aqua fauna in the study area has been affected.

1.11.3 Phytosociology

Phytosociological aspect study in the vicinity of mine area was carried out through perambulating and quadrant sampling method. This study was aimed at enumeration of the available plant resource and obtaining a broad representation of the existing floristic variation in the study area. Sample plots/quadrants were laid out in different parts of the area. A total of 10 quadrants of size 10 M x 10 M to study the tree layer were selected. All species encountered during the transect walk were recorded.

1.11.4 Status of Fauna in study Area

A detailed survey of mammalian, avian, reptile was conducted in study area. Both direct and indirect methods of population assessment were followed for recording fauna. The entire study area were perambulated all along line transects and observations were recorded for direct sighting of the animals during different timings. Indirect method of population assessment of fauna was based on following evidence.

- Footprints of animals
- Hair, hoofs and droppings of animals
- Existing habitats of Wild Life
- Interaction with local people
- Interaction with forest officials
- Other secondary sources

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1.12 Details of Flora in Core Zone

The study has been conducted under the following sub heads:

- Agricultural crops – Details not required in the Wild Life Conservation Plan
- Commercial agricultural crops – Details not required in the Wild Life Conservation Plan

- Plantation done by state forest department
- Natural vegetation
- Endangered species – According to survey and local information, no Schedule I species is found in the Study Area.
- Other if any (specify) - None

The details of plantation done by forest department in and around the study area are given below:

LOCAL NAME	BOTANICAL	FAMILY
Shisham	Dalbargia sissoo	Fabaceae
Subabul	Leucaena leucocephala	Mimosaceae
Eucalyptus	Eucalyptus globules	Myrtaceae
Cassia	Cassia siamea	Caesalpinaceae
Babul	Acacia niclotica	Mimosaceae
Teak	Tectona grandis	Verbenaceae
Arjun	Terminalia arjuna	Combrataceae

The details of Natural Vegetation / forest type in core zone is attached in Annexure 1 A

1.12.1 Endangered Species:

There is no endangered species (as per red book of BSI) in the study area. Further no endemic species were found related to the study area.

1.12.2 Detail of Flora in Buffer Zone

Study has been conducted on the same lines as suggested at items mentioned above. The details are given in Annexure 1 B

Endangered Species:

There are no endangered species (as per red data book of BSI) in the study area covering up to buffer zone. Further no endemic species of flora were found in the study area during the survey.

Details of Fauna in Core Zone:

The study of fauna has been carried out under following groups:-

1. Total listing of faunal elements.
2. Endangered species (as per wild life protection act)
3. Endemic species.
4. Migratory species with migration route through study area.
5. Details of aquatic fauna.

The list of fauna generally found in the core zone is given in Annexure 2 A

1.13 Endangered and endemic species:

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No endangered or endemic species was found during the survey and during interaction with local villager about the likely animals of the area.

1.14 Migratory species

No migratory species including migratory birds were reported during the survey.
On interaction with villagers, no migratory birds were identified which could be an inhabitant of the area in winter.

1.15 Details of Fauna in Buffer Zone:

The study was conducted on same lines as grouped in the core zone. The details are given as under.

The list of fauna found in buffer zone during studies and during interaction with local people is given in Annexure 2 B

1.15.1 Endangered and Endemic species:

No endangered or endemic species was found during survey and during interaction with local villagers about the likely animals in the area.

1.16 Migratory species:

No migratory species including migratory birds were reported during the survey.

Ministry of Coal, Govt. of India allocated Tubed Coal Block jointly to M/s HINDALCO Industries Ltd. and M/s The TATA POWER Company Ltd.

The Tubed Coal Block in Central Coal Field Command Area has been allotted for working through a Joint Venture Company for meeting their proportionate share of requirement of coal for 750 MW thermal power plant to be set up by Hindalco and for 500 MW thermal power plant to be set up by Tata Power, both plants in the state of Jharkhand.

1.17 Location and Area Profile

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According to topographical Sheet

Latitude (N) 23^0 48′ 20″ to 23^0 50′ 09″

Longitude (E) 84^0 34′ 09″ to 84^0 35′ 45″

The core of the lease area is located in 73 A/9 and the buffer of the lease is covered in 73 A/10, 73 A/5 and 73 A/6 topographical sheets of survey of India.

The Total Area of the Lease Hold is 460 hectares expected to be worked for 30 years.

Location

The block is located in Latehar district of Jharkhand state with following co-ordinates.

Latitude (N) 23^0 48' 20" to 23^0 50' 09"

Longitude (E) 84^0 34' 09" to 84^0 35' 45"

1.17.1 Communication

The block is connected to NH 75 at Latehar by a black topped 12Km long road. Gomoh – Barwadih loop line of East Central Railway runs on Southern side about 10 Km away.

Proposed Leasehold Area 460 ha

1.18 Geological Exploration

Altogether 22 Boreholes were drilled (GSI – 2 BHs + MECL – 20 BHs) besides geological mapping, survey etc. A Geological Report was prepared in 2006 based on the field and above boreholes data. However, some indicated reserves in dip side are there and the same will be proved within a year of start of the mine.

Geological Formation & Coal Seams.

Archeans - Archean rocks form the basement of the sub basin.

Barakar Coal Seams – 13 Co-relatable coal seams/ sections have been found in Barakar formation.

Reserves

The coal reserve as per the geological repot is 189.8228 MT including 23 million tonnes of indicated reserves.

Grade of Coal

Grade of coal varies from D to G, major is F.

1.19 Mining Method

Considering the geo mining features of reserve, it has been decided to mine coal by opencast method using surface miner and shovel dumper combination.

(I) Quarry Boundary –

The boundary of the quarry is given below.

Eastern boundary – trace of fault F2 and arbitrary line extended towards north

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Northern boundary – An arbitrary line passing 640m and 820m north-west of borehole MAT-13 and MAT-14 respectively.

Western boundary – Boundary fault F1 & arbitrary line towards north passing 280m & 584m west of borehole MAT-10 & MAT-13 respectively.

Southern boundary – An arbitrary line passing 160m,80m&416m south-east of borehole MAT-2,MAT-1&MAT-18 respectively.

1. **Rated Capacity** – 6.00 MTY of coal
2. **Life of Mine** - 30 Yrs (Including Construction)
3. **Development Activities**

For smooth progress of mining, the following activities are to be completed.

(i) Shifting of villagers overlying mining area.

(ii) Diversion of part of Sukri River.

Mine Drainage –

The maximum accumulation of water from rainfall & seepage has been assessed as 577500m^3/Day. Required pumping rate has been assessed as 4812.5 m^3/hr. 9 number of pumps of 540m^3/hr with 200m head have been provisioned.

Disposal of Waste –

Top Soil

A total of 0.5 Mm^3 of top soil would be removed & stored for reuse during land reclamation. Much of top soil, however can be concurrently used.

External Dump A

Dump A would accommodate 55.51 Mm^3. Top level of Dump would be 500mRL. It will have 3 tiers each of 30m.

Coal Transport

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Coal will be transported by railway wagons to Hindalco Power Plant at Sonahatu and TATA Power thermal plant at Tiruldih. The lessee intends to put-up a railway siding near mine for transport of coal, directly from pit head to consumption points.

1.20 Environment Management

The environment management of project would cover :-

- Land Reclamation including reclamation of External & Internal Dumps.
- Waste water management.
- Air Quality Management.
- Resettlement & Rehabilitation of Project Affected Families.

Mine Closure Plan

A progressive Mine closure plan is under development for the mine. Activities under this component of mine closure plan would be carried out during operation of mine, including consistent reclamation of dumps.

Final Mine Closure Plan

Final mine closure plan would be developed 5 Yrs ahead of scheduled date of closure of mining operation.

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About the Coalfield

The Auranga coalfield (C.F) is the eastern most part of North Koel Valley of Gondwana basin. It is about 8km west of north Karanpura Coalfield, which is western most part of Damodar Valley of Gondwana Basin.

Auranga CF covers an area of 250 Sq. km and is located in Latehar district of Jharkhand State. The coalfield, trending east- west, is a narrow gondwana basin, wider in east and tapering in the west. Tubed Block is one of the identified non-CIL blocks and lies in the northern part of Auranga C.F.

1.21 About the Tubed Coal Block

The coal block has been jointly allotted to M/s HINDALCO Industries Ltd and M/s The TATA Power Company Ltd, in ratio of about 60:40. These companies, as required by allotment letter, formed a J.V. company named TUBED COAL MINES LTD (TCML). TCML is now proceeding to open an Open Cast Mine.

CMPDI awarded the job of Exploration & Preparation of Geological Report of Tubed Coal Block to Mineral Exploration Corporation Limited under priority Captive Mining Blocks.

MECL, commenced drilling in Tubed Block of Auranga CF in June 2004 & completed 3011.5m of drilling (20Bhs) till January 2005, in an area of 4.6 Sq. Km forming the Tubed Block.

The Mining Plan is based on the Geological Report of Tubed Block prepared on the basis of data generated in 22 Boreholes (2 GSI Bhs + 20 MECL Bhs), and published in March 2006 by MECL (Eastern zone, Ranchi).

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Location

The Tubed Block covering an area of 4.6 Sq Km is situated in Latehar district of Jharkhand State. The block forms a part of survey of India Topo sheet No.73 A/9 (1:50,000) between coordinates:

Latitude (N) 23^0 48' 20" to 23^0 50' 09"

Longitude (E) 84^0 34' 09" to 84^0 35' 45"

Physiography, Drainage & Climate

The block exhibits undulating topography. General slope is towards west. A prominent valley is located in SW part of the block along which Sukri River flows. The ground elevation (RL) varies from 386 m in the north-west (near the river) to 412 m in north east (high land area).

The drainage of the block is mainly controlled by Sukri River flowing in SW part of block. There are 3 East West flowing nalas which drain to Sukri River. Besides, there is also a nala located in the northern part of the block which also joins Sukri River near Bh MAT10.

As per annual temperature map of India (National Atlas), the block falls within the temperate zone having daily mean temperature of 22^0C-25^0C. The summers & winters are extreme. According to rain fall data, the area falls in the zone of 1000mm to 1200mm rainfall.

The Skilled Operational and Maintenance

Manpower for the Mine operation and workshop activities would be mostly outsourced. This is the area of major employment where jobs would be outsourced. Some other maintenance jobs would also be outsourced on contract basis.

The services sector comprising Town engineering, maintenance & security services where good number of workforce are required, would also be outsourced.

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Secondary Employment

Besides the primary employment potential described above, there is scope of secondary employment because the area as a whole, starts developing as and when construction work of mine starts. Large member of workers are engaged under contractors to complete the civil construction & Mine development jobs e.g. industrial & residential buildings, nalla diversion and other development jobs. Lot of works of supporting nature continues to be carried out during life of the mine thus generating secondary employment.

Tertiary Employment

Services sector in an industrial area like transport, Communication, artisans job, shops and establishments, education etc get a boom with increase in population of the workforce. They create situation for employment in these fields.

All above would create an economic well being of the people in the area.

1.22 ENVIRONMENT MANAGEMENT PLAN

The environment of any area gets affected due to industrial activities. Mining has its own associated impact e.g land form changes, impacts on ground water and resettlement of displaced people. The following are major ingredients of environment needing attention:

(i) Land Environment including waste generation.

(ii) Water Environment.

(iii) Air Environment.

(iv) Loss of flora & displacement of fauna.

(v) Displacement of people.

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1.23 Land Environment

Pre-Mining Land use of Proposed lease Area

The proposed leasehold area of the mine is 460Ha. Breakup of the pre-mining land use within leasehold is given below.

Forest land --	162.394 Ha
House Hold --	0.813 Ha
Agriculture land --	229.728 Ha
Waste Land --	38.810 Ha
Nala (streams) --	22.217 Ha
Road --	5.592 Ha
Others ---	0.446 Ha
Total --	460.00 Ha

1.24 Proposed Mining Land Use

Broad break-up of the land required for various purposes within the proposed lease hold area is given below:-

(I).	Quarry -	350 Ha
(II).	External Dump -	63 Ha
(III).	Mine Infrastructure (township) –	11.32Ha
(IV).	Nalla Diversion, peripheral road & safety distance -	35.68Ha
	Total -	**460 Ha**

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Post Mining Land Use:

The post mining land use envisaged for Tubed Coal Block is as follows:

(in hectares)

		Total area	To be afforested	Road	Nala/ Water body	Infrastructure
i)	Quarry area	350	339.00	7.00*	4.00 (water body)	---
ii)	External dump	63	63.00	---	---	---
iii)	Mine infrastructure and services	11.32	9.82	---	---	1.50*
iv)	Safety zone, barrier (Nala and road diversion)	35.68	15.85	5.83**	14.00 (nala)	---
	Total :	460	427.67	12.83	18.00	1.50

* For maintenance of afforested area

** For public transport.

1.25 Waste Generation & Disposal

During mining operation, a total of 280Mm^3 of overburden is estimated to be generated. In first few years of mining operation, a total of 40Mm^3 of O.B. will be stored in external dump located on North & East side of the quarry. During rest of the mine, O.B. will be dumped into decoaled pit to facilitate reclamation. A total of 200Mm^3 of O.B. would be backfilled.

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1.26 Water Environment

Surface Water

The lease area is traversed by seasonal nallas, running from East to West. The Sukri river enters the block from South side, then runs from South in north direction in western part of the block. After traversing half of the block it turns westward & leaves the block.

Entire length of Sukri River traversing within the mining lease would be diverted along the boundary of the block. As water flow from upland beyond the lease area will all be diverted to Sukri river or nala diversion would not affect any downstream users as no barrier will be created to stop flow of water.

Ground Water

The ground water in the area will be affected by open pit mining. However, Jharkhand is a moderately safe zone for ground water resource and Tubed coal mine being an isolated one, the effect would not be perceptible.

1.26 Waste water Generation & its Management

(A) Mine Water

In course of mining, waste water will be collected in the sump constructed in the deepest area. Source of mine water will be rain water and ground water seepage. The pumped out water will be led into a sedimentation Pond for proper treatment before it is used for industrial purposes or discharged into natural drains.

(B) Workshop Effluent

Waste water will be generated in the workshop where the Dumper & other mining equipment will be washed regularly. *It is proposed to provide an Effluent Treatment Plant for treatment of effluent from workshop.* Treated water will be recycled for washing in the workshop. This will reduce fresh water requirement.

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(C) Domestic Effluent

Sewage & salvage water will be generated in township. ***A sewage Treatment plant will be provided for treatment of sewage water. Treated sewage will be recycled for horticultural use. This will also reduce fresh water requirement for the project.***

1.27 Air Environment

Source of Dust & Gases

Mining & other allied activities will generate dust i.e. suspended Particulate Matter (SPM) & Respirable Particulate matters (RPM) as air pollutant. Beside dust, gases like SO_2 & NO_2 are generated due to use of vehicles and blasting in the mines. The transportation of waste and coal along the haulroads cause the generation as well as transmission of dust in to atmosphere. All these would pollute the air environment.

Suggested Measures for dust Control

The follow remedial measures would be taken:

(i) Wet drilling in O.B & Coal would be practiced.

(ii) Arrangement of fixed sprinklers on permanent transportation & haul road.

(iii) Arrangement of mobile sprinklers on shifting & changing roads which are not permanent.

(iv) Enclosures, dust suppressing jets and covered conveyers in coal handling area.

(v) Maintenance of good surface haul roads.

(vi) Rows of trees will be planted as green barrier along transport roads, outside quarry area, infrastructural area etc.

(vii) Green belt & block plantation in the vacant areas & residential colony.

1.28 Bio- Environment

Part of buffer zone and area around the leasehold, have poor quality forests and green cover. Some forest area is being affected within the block boundary. To minimize the adverse effects of forest cover loss, the total area covered by internal & external O.B. dumps will be densely

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vegetated with indigenous species of flora. This will help to bring the fauna back to the area once the vegetation grow and sustain particularly when the mining operation is over.

1.29 Displacement of People

As displacement of people is unavoidable due to mining operation, persons from villages falling inside the proposed leasehold area (about 201 families) are likely to be relocated. The proponent of the project has decided that all coal bearing area within the allocated block shall be open cast and as such actions to relocate the affected families shall be taken up on priority. A suitable resettlement colony, as agreeable to the displaced persons shall be developed with all basic facilities. They shall also be given priority in the employment generated. Resettlement of villagers will be taken up in the govt./revenue land proposed for acquisition.

1.29.1 Environmental Concerns

(i) Water harvesting system shall be made almost self sustaining for future uses.

(ii) Water reservoir in the mine, developed in coal excavated area shall be kept under close monitoring for assessment of its water quality for its future use. In the initial 3yrs the mine owners shall ensure this monitoring.

(iii) The vegetated land areas shall be handed over to village core group for managing its integrity and putting the same to sustainable uses.

(iv) All land released from infrastructural decommissioning areas shall be reclaimed for most productive land uses.

(v) Total waste dumps shall be reclaimed within 3 years of mine closure. No top soil dumps will be left over.

(vi) The toe wall side of external dump shall be strengthened so as to contain any sediments from entering land areas/water courses.

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CHAPTER – II

THE PROJECT

2.1 Water Resources and Utility

Water is a limiting factor as the entire area is monsoon dependent. Therefore water requirement for mining, maintaining their quality for use in mining as well as for the villages surrounding the mine or within the mining lease area will be given top priority. The ultimate drain out through streams (generally seasonal) goes to Sukri River which ultimately drains out in Auranga.

2.1.1 Ground Water Resources

The principal source of recharge to a ground water system is rain fall, seepage from tank and ponds etc. However, rain fall is the main source of recharge within the coal block. At future date, mine discharge could be a source of water in the entire locality.

The ground water withdrawal is generally for domestic purpose and irrigation. However, in the area there are no irrigation facilities by dams or canals. The only source of ground water draft is for domestic purpose and proposed mine discharge in coal block.

(a) Domestic consumption

As per 2001 census, the population of Tubed coal block area is 160 families. Taking 5 persons per family, population comes to nearly 800, the per capita consumption of 70 litres per day which is nearly half of the water requirement standardised for per capita water consumption in India. The total domestic water requirement comes to .026 MCM per year.

(b) Consumption by cattle:

Cattle consumption is assumed to be 10 percent of the domestic consumption. The total requirement comes to 0.0026 MCM per year.

2.2 Road and Residential facilities

The approach to the lease hold is by a part black top and part fair weather road negotiable all through out the year. As the nearest town (Latehar) is at about 10 km away from the mine site and the nearest

village is only about 14 km, the semiskilled and unskilled manpower will easily be available in the surrounding area and the outsider employees will be accommodated in a labour colony near the mining lease area and others in nearby villages.

2.3 Forests

The core area is having 460 hectares of lease hold out of which forest land is 162.394 Ha. As the proponent requires about 75Ha for workers & executive colony, 50 Ha for resettlement colony and about 200 Ha for railway siding out of the core area because no scope is left inside the core area after provisioning for workshop, services building and dump area. Thus total of 460 hectares will be required for establishing the entire project.

2.4 Land Requirement

Forest land --	162.394 Ha
House Hold --	0.813 Ha
Agriculture land --	229.728 Ha
Waste Land --	38.810 Ha
Nala (streams) --	22.217 Ha
Road --	5.592 Ha
Others ---	0.446 Ha
Total --	460.00 Ha

2.4.1 Township

Township will be established on tenancy and govt. land which is 50 hectares.

2.4.2 Re settlement colony

This will occupy 40 hectares of mainly govt. land.

2.4.3 Railway siding

Coal will be transported from Latehar rail head. A railway siding is proposed to be established by the proponent in private land/govt. land for which about 200 hectares of land is proposed to be acquired.

2.5 SPECIFIC PRESCRIPTION FOR THE PROPOSED AREA

I. Catchment conservation of rivers and its tributaries.

II. Supports local population.

III. Wildlife Research and education

2.5.1 Northern Dry Peninsular Sal Forest

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This type of forest is found in valleys. The crop consists of almost pure sal (*Shorea robusta)* with Asan (*Terminalia tomentosa*) Bija Sal (*Pterocorpus marsupium)*, Dhow (*Anogeissus latifolia)* etc. as associated species.

2.5.2 Northern Dry Mixed Deciduous Forest

This type of forest is present in most of the area except in valleys and depressions. The main species in the upper canopy are Asan, Salai (*Boswelia serrata*), Kend (*Diospyros melanoxylon*), Piar (*Buchanania latifolia*), Bauhinia spp. etc. Small trees and shrubs like *Cleistanthus collinus, Holorhenia antidysenterica, Ziziphus spp.* etc. are found in lower canopy.

2.6 Other Vegetations

Besides the above two main types of forest, other available types of vegetation deserve a special mention due to their importance from the food and cover point of view. They are as follows

2.6.1 Under storey vegetation

Almost in the entire area, except in pure patch of sal, the under storey vegetation consists of *Ziziphus, Nyctanthes arboritristis, Woodfordia frutiosa, Ixora parviflora, Casissa spinarum* etc. These species act as important food source of herbivores besides grasses, especially during dry periods.

i) **Climbers :**
Common climbers of the area are Bauhinia vahli, Butea superba, Smilax spp. Etc

ii) **Grasses :**

Main grasses of the area are *Heteropogon contortus, Chrysopogon spp. Dicanthium spp.* etc. that occur in open patches (blanks) and abandoned cultivated lands. Some of these grasses spp. are important sources of food for herbivores. However wide stretches of grasslands are difficult to find.

Due to biotic pressure like forest fire, grazing, cutting and collection of fire wood and small timber, majority of forest area gives the look of a rooted waste.

Present condition of the Habitat in buffer zone area of mining:

The habitat in surrounding buffer zone area is highly degraded. The pre-dominant tree species includes Sal, Kendu, Palas, Mahua, Awanla, Khair, Sidha, Karonda, Piyar etc. Except for the Mahua the other species are hardly more than the size of pole crop. The Mahua contributes significantly to the economy of village community. Hence local villagers have given protection to this species. Such type of habitat is suitable for lesser known animals like Hare, Hyena, Monkey, Wild boar, Palm civet, barking deer, Jungle cat, porcupine etc. During inspection of the site the presence of above animals has been substantiated by the villagers though they have not been sighted due to their sparse population. Hunting is not uncommon due to openness of the forests and large population of semi-urban and urban population surrounding these forests.

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CHAPTER-III

WILDLIFE CONSERVATION PLAN

Once, Latehar was famous for quality of forest. However due to biotic pressure, the lease hold and the surrounding being less than 10 KMs in crow flight distance is now completely degraded. The area has been worked under coppice with standard system. Uncontrolled grazing, illicit felling of low diameter trees have not allowed the forests to grow at a desired level. Photographs taken from different angles of the lease hold indicate that the vegetation which was having quality ¾ Sal Forests at the time of revising working plan is now almost at the level of degraded waste land. The forests were holding very good population of herbivores animals and once upon a time Latehar Forest Division was famous for hunting.

The Sukri River passing through the lease hold flows like a nala even during monsoon though the photograph indicate that the bed of the river is more than half kilometer wide.

3.1 Wild Life Management

1. No blasting between Sun set and Sun rise i.e. night – noise reduction technology to be adopted.

2. Two staff to monitor wild life must be provided with accommodation and communication, to keep watch on poaching, damages to crop by wildlife and monitoring movement of animals. The entire cost should be borne by the lessee.

3.2 Fauna

Mining activity is expected to disturb wild animals due to increased human activities. So it is necessary to reduce the impact by using modern techniques that has come up to reduce noise pollution. It is suggested that noise reducing devices should be used during blasting. No blasting should take place between sun set and sun rise. Many animal species that are reported from this area occur in significantly less number specially due to following factors.

1. Overgrazing by the domestic cattle, leading to food shortage for herbivores.
2. Habitat degradation and disturbance by large number of settlements leading to limitations of space, food, water and cover.
3. Availability of less number of prey bases.
4. Soil erosion and siltation of water bodies leading to scarce availability and distribution of drinking water especially in summer.
5. Forest Fire
6. Human presence for collection of fire wood, grass, small timber and leaves.
7. Illicit felling.

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3.3 Summary of Threats to wildlife:

In the present context the following are perceived to be the main threats for the wildlife in the proposed area.

1. Ever intensifying biotic pressure due to increasing populations of both human and cattle in and around, rampant poverty and unemployment causing in habitat degradation for the Wildlife.

2. Shortage of food, cover and water base for wild fauna. The entire area is being heavily grazed by domestic cattle.

3. **Illicit felling & fuel wood collection**: The illicit felling by villagers for there requirement and for selling the same in the local market. The hundreds of head loads are being collected by women residing inside forest or in fringe villages.

4. **Availability of water**: The water becomes an important threat to wild animals immediately after March. The condition remains same up to the end of June and beginning of July till monsoon showers strike the area. During this period water is localized at few places. Sometimes during the pinch period it leads to death of wild animals due to thirst or force them to enter villages which makes them vulnerable to poaching.

5. **Fire**: Since ages the area is subjected to annual fires which are mostly man made. These fires adversely affect the ground flora and the vegetation of this area. Besides valuable soil moisture; nesting sites of innumerable birds & insects, several palatable species of grasses are lost due to fire.

6. Inadequate manpower despite sanctioned strength and lack of proper training for management related issues is another cause of poor Wildlife Management

7. Lack of infrastructures like vehicles, equipments, wireless network, watch towers, fire fighting equipments etc.

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3.4 Wildlife Conservation plan has been discussed in following headings –

(i) Food Management :
(ii) Water Management :
(iii) Cover Management :
(iv) Lantana Management :
(v) Wildlife health :
(vi) Anti poaching/illicit felling :
(vii) Fire Management :
(viii) Soil and water conservation :

(I) Food Management:

The lease hold and buffer zone is mostly fragmented and in degraded state. Hence the population of prey base species is non--existent. The grasses are very sparsely distributed and so unable to fulfill the requirement of herbivores. If the position does not improve, the carnivores species like lesser cats, jackals, hyena may also have to face local extinction. Hence the buffer zone area should be managed in such a way that plenty of food should be available round the year for herbivores. It will be done by ensuring habitat protection and its improvement by planting grasses and other browse species like Zyzyphus, Bauhinia, Bamboos etc, fruit trees such as Bargad, Pipal, Wild fig etc at suitable places. Similarly a number of salt licks will be provided at different places in the buffer area. Besides in order to provide edge effect to herbivores the 10-15% area of degraded forest of buffer zone area will be developed as grassland by the forest department.

Heteropogon controtus, chrysopogon species, Dicanthium sp., Saccharum sp. are the main grasses constituting the ground cover. The grasslands have been deteriorated due to weed infestation and over grazing. This needs proper management. The miscellaneous forest with dense under growth and brakes of bamboo clumps provide the necessary food support for Bears, Wild Boars and many other small animals like Porcupine and Birds. The scrub forest supports food requirement of other ungulates, Hyena, Jackal and Birds like Jungle Fowl.

Food and Feeding Habits of main species

The carnivores of the area feed mostly on the ungulate population or small herbivores. Sambhars, Cheetal, Barking deer, wild boars and blue bulls and village cattle survive on grasses and shrubs found in the vegetation existing in the buffer zone but their population is minimum due to biotic pressure and poaching.

Hyena and jackal are mainly scavengers who thrive mostly on the left over material of the kills of other minor predator species and parching birds. Jackals also kill smaller animals and birds like rabbits, jungle fowl, partridges and smaller fawns of deers.

On the basis of the field observations the main food for the important herbivores of the area have been identified and listed below. The study is by no means complete and further systematic exploration is required.

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Sambhars:

Sambhars mostly browse on the leaves, young shoots, flowers and fruits of *bauhinia species, Eugenia dalbergioides, Terminalia species, Zizyphus species,* leaves of Bamboo, tender leaves of sal, etc. They have been rarely found grazing on grasses. The food for sambhars is usually available through out the year, though the intense heat and incidences of fire make them strive hard for food during peak of summer.

Cheetals

Cheetals have been found mostly grazing upon the following species of grasses native to the area like *Heteropogen controtus, Chrysospogon species, Dicanthium species, Sanchharum species.* The availability of grazing materials for the Cheetals becomes scarce by the end of the winter season, when the grasses dry up. They often visit agricultural fields to graze during this critical period.

Wild Boars

Wild boars live mostly on rhizomes, roots and tubers of the species like: Saccharum spp., Bamboo (Dandorocalamus strictus), Semal (Selmalia malabaricum) etc.

Monkeys and Langurs

Monkeys and langurs have been observed to thrive on: tender shoots of Bauhinia spp Semal, Bamboo, Leaves and fruits of Acacia Spp, Ficus spp., Morus spp., Kend (Diospyros melanoxylon). Zizyphus spp Aegel marmelos etc.

Birds

The birds mostly feed upon insects and fruits of the species like: Fiscus bengalensis, Fiscus glomerata, Kend (Diospyros melanoxylon), Piar (Buchanania latifolia), Zizyphus spp., Bridellia retusa, Lantana etc. Emphasis should be given for plantation of fruit bearing frees mentioned above especially near water source or reservoir for providing perching and nesting site.

On the basis of information collected above, the project proposes for regular plantation of indigenous species with an aim to improve the habitat in buffer zone area, so that number of herbivores increase. Fund will be made available for plantation as per the scheme prepared by forest department and infrastructural support will be given by the lessee.

(ii) Water management:

Scarcity of water becomes an important threat to wild animals immediately after March because most of the streams of buffer zone area of proposed mining site are seasonal. The condition remains same up to July. After rainy season water is localized at few places. Such condition arises due to siltation of all streams which have reduced their water holding capacity. **A series of check dams in seasonal streams of buffer zone of mining site is required to improve the water regime of the habitat.**

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Water is essential not only for animals but also for plants, microbes and all ecological processes. Both *in-situ* and *ex-situ* conservation of water will be done by various means. It will be ensured that catchments remain covered with vegetation at all times by protection and plantation, so that erosion and run off will be kept at the minimum. Works like creation of contour trenches; gully plugging etc. will be carried out wherever necessary from time to time through annual plans. De siltation of main reservoirs even in the villages will also have to be done periodically, so that water will remain available even in summer months. The available water in the lease hold proposed to be pumped out will be channelized to fill up the low lying water holes in the buffer area so that they may cater to the needs of wild animals particularly during summer month.

Management of water is therefore must for improving the water regime for the purpose of Wildlife Conservation. In any case, if there is a water course (whatsoever small or large may be) it should be allowed to flow uninterrupted except for making series of check dam or for any special need at the time of mining operation.

(III) Cover Management

Cover or shelter is another important requirement for the welfare of the species. The cover may be natural or artificial. In case of Bears, Porcupine etc., caves or holes are required for their resting and breeding period. Lack of such natural caves or holes is limiting factor for animals mentioned above. These animals will never stay in an area which is devoid of above type of shelter. As the buffer zone area of the project includes series of hillocks, the cover for carnivores is likely to be available.

In case of herbivores, sufficient cover of either grass, wood, brushwood etc. is required for shelter, protection and breeding. Shrubs are used as cover for small animals and trees give shelter to larger animals during hot summer days. It also acts as shelter for birds. Grasses is used for breeding for hares, deer and other parching species. Small bushes provide breeding, resting and protective shelters for birds like Jungle Fowl, Quails and Partridge. Shrubs of lantana provide protective shelters for dears and other pray animals from predators. On the other hand it provides ambush cover for successful predations to Carnivores.

On the whole it can be said that different kind of covers like winter cover, summer cover, refuse cover, breeding cover, fawning cover, resting cover, ambush cover and nesting cover are required for different animals for different purposes. It will be done by ensuring strict protection of habitat, that includes dens, caves, rocks, streams, ravines, vegetal cover etc and further, by improvement of habitat by planting in blanks with suitable spp, rehabilitation of degraded forest areas etc. **The occurrence of fire incidence greatly hampers the availability of nesting and reproductive cover for birds. So incidence of fire should be checked efficiently and effectively.**

Before start of work it is suggested that the following mitigation activities are carried out. A strip of 7.5 meters be left within the lease. In no case exotic species should be planted.

(IV) Weed Management:

Weed has become a menace in some parts of the buffer zone area, especially in degraded forest areas. In the interest of the wild life, therefore, it has to be cleared by uprooting if they have formed thickets.

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Lantana is one of the weeds coming up in the area. Spread of lantana will disturb the wildlife habitat. However it must be mentioned that lantana provides protection to parching species and also give predation cover. It also provides berries as food to birds and some smaller animals. Besides varieties of insects and butterflies thrive on them. The young leaves are browsed by ungulates, therefore hundred percent eradication of lantana is never suggested. Employing casual labours for this purpose on a regular basis may be required. Locals will also be educated and encouraged to remove this from their agricultural fields and surroundings. People will also be allowed and encouraged to collect it from forest for fuel wood purpose. Basket making is another option.

The eradication of weeds should be based on scientific knowledge i.e. root cut back method. In this process weeds should be cut 5 cm. below ground level. Afterwards it should be turned upside down and grasses should be planted. However it may be mentioned that weed invasion in mass scale is due to poor management of the forest and opening up of the canopy. Plantation should be taken up in blanks with religeosa, ficus bengalensis, ficus glumerata, all three myrabolans species, Madhuca indica, Bombax civa, Albizia spp. Acacia catechu and bamboo etc. These species will not only help villagers to get benefit out of them but also will be congenial to wildlife.

Weeds should be eradicated in phased manner and such areas should be developed as grassland or for plantation of species mentioned above including some more fodder species.

(V) Wild Life Health

Efforts will be made to immunize the domestic animals in and around the proposed area against contagious diseases like Food & Mouth disease, Rinderpest etc.

Mitigative measures:

i) In order to avoid the spread of disease stall feeding should be encouraged but it cannot be done unless the breed of cattle is improved.

ii) The villagers should be motivated to reduce the number of cattle and rear hybrid cattle.

iii) Through awareness programme, villagers should be discouraged to send their cattle inside forest area for grazing and use of water source used by wild animals.

A programme like castration of stray bulls and artificial insemination should be introduced to reduce number of unproductive feral cattle.

(VI) Anti poaching / illicit felling:

Two staff provided by the forest department as mentioned earlier for which the cost will be borne by the lessee will take care of poaching and illicit felling and loss of property or life by wildlife to villagers.

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Mitigative measures:

(i) **Infrastructure facilities and vigilance:** Forest Department should be provided with facilities to monitor wildlife movement when the work starts. To begin with a wild life cell, adjacent to the lease should be created. A wild life cell will monitor movement of wild animals, control poaching and evaluate loss of life and property by the wildlife.

(ii) **Education / Awareness among local people:** The implementing officer should take immediate action for the confidence building process by initiating awareness camps. They should also try to make local people sensitive about wild animal & its benefit.

(VII) Fire Management:

Fire: The mining lease may cause naked fire, electric fire or fuel oil fire in the stock piles of coal, electric substations, work shops, garage, diesel depots and general stores. The lessee has to propose large number of water hydrants in the lease area. There has to have a magazine therefore clearance of 15 meters radius of dry vegetation, fire extinguisher in sufficient number and sand and water filled buckets are to be kept. Arrangement of mounds around the magazines in case of explosion and follow up of all the guidelines in schedule VIII of the explosive rules are must.

With the onset of dry season in sensitive areas people will be educated to prevent intentional or negligent occurrence of fires and to extinguish them completely. For combating the menace of fire, a fire fighting squad will be employed on daily wages every year during summer for the purpose of early detection and control. Whenever in spite of all the precautions and preventions, if fire occurs, all the staff along with their assistants and required fire fighting equipment, food and water etc. shall rush to the spot, mobilize the local people's help and control it as quickly as possible. Occurrence of fires, location, causes, extent of damage etc will be properly documented for improving the fire management plan periodically. A network of fire line should be created to avoid incidence of fire and its spread.

Most of the fires in forest are intentional set by villagers for obtaining new flush of grasses for grazing and for the collection of Mahua flower or Sal seed or for the purpose of encouraging new flush of kendu leaves suitable for bidi making etc. In addition, accidental fires are caused by throwing unextinguished cigarette butts or bidis, by passer by.

These fires naturally go against the conservation values of the area as the food and cover base of the wild fauna is destroyed and the soil is exposed to the danger of erosion and run off, weed infestation and, therefore, natural flora is replaced by unpalatable species.

It is always better to have controlled burning as a management tool. Otherwise fire is harmful because it leads to loss of cover of herbivores as well as destruction of eggs and nests of ground birds like Jungle fowl quail, peafowl and partridge or bush living birds. Besides it accelerates soil erosion, deteriorate the forest and ultimately reduce the aesthetic value of the forest.

The project will implement following strategies for fire prevention

(i) The adverse impact of fire should be highlighted by signboard & distribution of pamphlets.

(ii) The Eco-development committees should be made aware of their duties in case of occurrence of fire.

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(iii) Based on requirement creation of new fire line and one / two fire watch towers (as per coverage) after careful study and survey work can be undertaken in buffer zone.

(iv) A fire fighting squad should be maintained through out the fire season (90 day from mid February to mid June).

3.5 Soil and water conservation

Soil and water conservation measures to be practised normally in a coal mining site as laid down in the lease agreement.

3.6 The general practice adopted in mining

Top soil is scrapped and dumped. After mining the pits are filled with over burden and stored top soil is spread over the area. After one year of consolidation, plantation is taken up. It is suggested that slopes are made gradual so that maximum rainwater percolates and gradually released to flow through streams.

The species selected for plantation are indigenous and should have soil binding capacity. As the area is Sal rooted waste therefore it is expected that Sal will grow if planted carefully. For this technology is available with Forest Department.

Though there is no steep slope observed in mining site even then bench terracing is suggested to avoid soil erosion due to creation of voids while extracting coal and reclamation progresses. The terraced slopes should have support of brushwood fences to avoid landslides.

3.7 The lessee has proposed reclamation of external overburden dump and soil conservation

The external dump which will be created during mining, are exposed to soil erosion due to wind and surface run off caused by rain and high velocity wind which may render the dump unsuitable for biological reclamation due to loss of fine and course soil, making the dump unstable, raise the SPM/RPM level in atmosphere and raise the level of suspended solid particles in the surface water. All these conditions will cause source of environmental pollution and safety hazards. It has been suggested that soil conservation measures be initiated to make the dump stable till the soil is loosed for biological reclamation. The lessee has also agreed to control erosion on inclined surface of the dump, give a proper angle of repose give steps (at least 2). Water channel is to be provided at the toe of the dump and the silt will be controlled in this channel. The channel will lead to a water detention tank where silt will be deposited. The top soil scrapped from the mining area will be spread over the dump.

3.8 Ecological Development of the area

As the coal extracted from the mine will be for captive use of proposed power plant, therefore demographic survey is needed to know:-

1. Identify and categorize project affected families (PAF)

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2. Work out the package for each category of PAF as per approved policy to ensure a better standard of life and sustainable source of livelihood for the PAFs.
3. Work out the cost of each package
4. Lay down basic fee infrastructure facilities for the proposed resettlement colony with a time frame.
5. Integrate developmental activities with R&R activities proposed by Jharkhand Government

The action plan based on approved Jharkhand Resettlement and rehabilitation policy has been docketed in the proposal.

1. Afforestation

The blanks are to be filled up around the core of the mining lease. The plantation has to be carried out by planting indigenous species. This will be an annual expenditure covering approximately – about 20 hectares, or whatever is required, every year till the end of the mining lease.

Cut back and tending of the natural degraded forest. This activity will overlap plantation work i.e. no plantation will require except for blanks. As stated earlier the surrounding area is mostly rooted waste therefore this operation will get the desired result of forest cover which will support the existing wildlife for fodder and cover from danger. It will also help reducing the noise of transport vehicles, heavy machineries and blasting.

2. Eco-Development

a) Vocational training in six centres covering 10 to 12 villages in one centre. This training will particularly benefit the female population and the elderly persons who are not capable for hard work like working in the coal fields.

b) Health care programme covering of buffer zone, one health centre should be constructed and managed by the lessee. One ambulance van already available at the mines shall cater to meet emergency requirement of the adjoining villages. Non recurring expenditure of ambulance and health centre building. For this recurring and non-recurring expenses have been shown in the table.

c) Cattle Development Programme Vaccination of all improved breed cattle. It has generally been seen that the cattle in the state of Jharkhand are kept as status symbol. More the number of cattle higher is the status. These cattle are used only for draft purposes for pulling carts and shallow ploughing. Distribution of improved breed cattle as a demonstration of at least one cattle in every centre should be taken up by the lessee.

It is imperative to use the Eco-development strategy as a tool to get local support. The long term objectives and short term objectives of eco-development measures has been identified as follows:

3.9 Long Term objectives

(i) To promote long term sustainable use of resources.

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(ii) To uplift the quality of life of people in the zone of influence.

(iii) To enhance the biological and cultural biodiversity of the protected area.

3.10 Short term objectives in context

(i) To reduce the fuel wood pressure on the Project Area (PA).

(ii) To reduce small timber pressure on the PA

(iii) To regulate grazing pressure on PA and regulate the grazing by promoting stall feeding. The framers will be encouraged to grow fodder grasses on their own land.

(iv) To reduce the dependency of villager on small timber for house construction by promoting use of alternative. To reduce the crop damage by half within 10 years of plan period.

(iv) To raise the per capita income of people.

3.11 Strategies to meet the above objective are as follows

Objective 1: To reduce pressure on forests

Strategy (a): To reduce the fire wood consumptions in villages, introduction of fuel efficient chullah for all village families should be carried out.

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For small families of 5 to 8 members a chullah of about 1 ft. dia. will be provided. For bigger families 1.5 ft. dia chullah will be supplied.

Strategy (b): To promote fuel wood plantation and regulating fire wood collection the fuel wood plantation will be encouraged on bund and community land. The nursery should be prepared or plants should be distributed free of cost among villagers from permanent nursery of forest Dept.

Strategy (c): Further, to reduce pressure on forest, labourers working in the mining project should be provided with fuel which is practice in coal mining.

Objective 2: To reduce pressure of small timber on PA during plan period.

Strategy (a): To increase the availability of timber along with the plantation of fodder the villagers will be encouraged to raise trees of Dalbergia, Sissoo, Gmalina arborea, Tectona grandis etc. on the community land.

Objective 3: To reduce grazing pressue.

Strategy (a): To reduce consumption of grasses the villagers should be motivated to replace their unproductive cattle by high milk yielding hybrid varieties.

Strategy (b): The villagers will be motivated to grow fodder on their own land for stall feeding. The seeds of grasses should be supplied free of cost to the interested villagers.

Objective 4: To reduce the dependency of villagers on small timber for house.

Strategy (a): To provide alternative the project officer should contact block officer for housing scheme of India Government like Indira Awas Yojana to facilitate construction of permanent houses in the fringe village; the villagers are required to provide only labour input in such scheme.

Objective 5: To raise the per capita Income of the villagers

Strategy (a): Concept of self help group shall be initiated with initial revolving fund by the involvement of local NGOs to involve people to work in groups in economic activities to increase per capita income and more emphasis should be given to women groups.

Strategy (b): By promoting Mushroom cultivation. At least 5 villagers from each village will be given training for mushroom cultivation. The implementing officer should take initiative for formation of a society which will take care for marketing.

Strategy (c): By providing financial and technical assistance for sericulture, Pisciculture, Poultry, Duckery, Piggery, tailoring Handloom. The implementing officer should survey the villagers choice and should decide accordingly for the type of training to individual.

Objective 6: To increase conservation awareness.

Strategy (a): Informal interaction by arranging debates, painting competition among target groups especially school children during wild life week.

Strategy (b): Creating opportunity for formal interactions. Between mining authorities and eco-development committee.

Strategy (c): Distribution of posters and pamphlets.

Support to forest department: - A wild life cell should be created near the lease hold for monitoring movement of wild animals, anti poaching and damage to life and property of the villagers by wildlife is essential. Their salary and other allowances including accommodation and communication should be provided by the lessee.

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The lessee has proposed measures for improving the habitat such as:-

- **Green belt**
  - (a) Around lease area
  - (b) Along the road
  - (c) Along both sides of belt conveyor
  - (d) Air pollution sources like coal yard and coal handling plant
  - (e) External dump and back filling area
  - (f) Ornamental trees in different locations of the lease
- **Store**
  - (a) For seeds
  - (b) For fertilizers
  - (c) Insecticide/pesticide
  - (d) Tools
  - (e) Equipments

- **Soil laboratory**
  This will facilitate improvement in soil quality and also help knowing the requirement of manures and fertilizers for improve agriculture.

- **Nursery development**
  A five hectare plot has been earmarked in the northern side out of the lease hold. Small green house will be created inside the nursery to facilitate growth of delicate species in particular.

- **Storage tank** for irrigation of nursery. This water tank will also facilitate irrigation in the plantations in case of scanty rainfall.

Separate manpower will be provided for nursery and plantation.

The above suggestions have been made for Wild Life Conservation but the duty and responsibility of the Forest Department cannot be undermined nor can the lessee take up all the activities mentioned above in totality. Therefore the budget shows only sharing of responsibility of the lessee in supporting the Forest Department financially and assisting them in specific cases like fire control, anti-poaching etc. They will also assist in vocational training, eco-development, education and awareness programme.

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Budget Capital

For Wild life Management

1.	Plantation including soil & moisture conservation work as per norms of forest department to improve habitat	Rs. 5. 00 Lakhs (Annually)
2.	Silviculture operation on degraded forest land and cut back in rooted waste	Rs. 3.00 Lakhs (Annually)
3.	Habitat improvement Eradication of unwanted species in buffer zone area Fire protection work including fire watchman, creation of fire line etc	Rs. 1.00 Lakhs (Annually)
4.	Research and Monitoring One research scholar to carry out scientific studies on impact of mining on ecosystem	Rs. 2.00 Lakhs (Annually)
5.	Salary and other emoluments of staff in the Wild Life Cell	Rs. 3.00 Lakhs (Annually)
6.	Construction of water holes in the buffer zone to facilitate wild animals and also plantation	Rs. 2.00 Lakhs (Annually)
7.	Eco development	
8.	a) Vocational training to weaker section, females and old persons in four centers in the buffer zone of the mining lease and rehabilitated village @ Rs. 50,000/- per centre	Rs. 2.00 Lakhs (Annually)
9.	b) Veterinary camp for immunization of cattle, stall feeding, distribution of improved variety of cattle, control of ferral cattle etc.	Rs.1.00 Lakhs (Annually)
10.	c) Water harvesting structure including series of check dams, bore well, pond etc.	Rs. 5.00 Lakhs (Annually)
11.	d) Awareness programme including signage, distribution of pamphlets related to wildlife conservation	Rs. 1.00 Lakhs (Annually)
	Total	**Rs. 27.00 Lakhs**

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List of Flora

S. No.	Botanical Name	Local Name
1.	Acacia cate	Khaira
2.	Aegel marmelos	Bela
3.	Anthosephalus cadamba	Kandamba
4.	Azadiraachta indica	Neem
5.	Bauhinia malabarica	Amti
6.	Bombax ceiba	Semal
7.	Borassus flabellifera	Tad
8.	Butea monosperma	Palasa
9.	Bauhinia racemosa	Asta
10.	Bauhinia variegata	Kachnar
11.	Chloroxylon swietenia	Bhirra
12.	Cochlospermum religiosum	Galgala
13.	Dalbergia sissoo	Sissoo
14.	Caseraria graveolens	Gilchi
15.	Cassia fistula	Amaltas
16.	Phoenix sylvestris	Khajur
17.	Pongamia pinnata	Karanja
18.	Ficus glomerata	Gular
19.	Diospyros melanoxylon	Tendu
20.	Diospyros montana	Bistendu
21.	Magnifera indica	Mango
22.	Eriolaena hookerianna	Bouti
23.	Ficus bengalensis	Bargad
24.	Schrebera swietenipides	Mokha
25.	Ficus religiosa	Pipal
26.	Tactona grandis	Sangaun
27.	Pterocarpus marsupium	Bija
28.	Terminalia tomentosa	Saja
29.	Terminalia arjuna	Arjun
30.	Zizphus mauritiana	Ber
31.	Schleichera oleosa	Kusum
32.	Madhuca indica	Mahua
33.	Sorea robusta	Sal
34.	Syzygium cumini	Jamun
35.	Tamarindus indica	Imli

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Bushes:

S. No.	Botanical Name	Local name
1.	Achyranthes aspera	Chirchira
2.	Alangium sativifolia	Akol
3.	Andrographis paniculata	Bhuli Neem
4.	Carissa opaca	Karonda
5.	Murraya exotica	Ban mirchi
6.	Petalidium barleriodes	Indrajata
7.	Peucamum nagpurense	Bandhania
8.	Eranthemum pulchellum	Bantulsi
9.	Helicteres isora	Marorphali
10.	Hibiscus ficulenus	Banbhendi
11.	Holarrhena antidysentrica	Dhuri

Creepers

S. No.	Botanical Name	Local Name
1.	Jasminum multiflorum	Kund
2.	Vitis repanda	Daker bel
3.	Zizphus rugosa	Kantakuli
4.	Lechbocarpurs ferutescens	Dhimar bel

Grass

S. No.	Botanical Name	Local Name
1.	Andropogon bumilus	Dalphulia
2.	Thysanolacns maxima	Phulbari
3.	Cynodon dactylon	Doob
4.	Dichantium annalatum	Chhoti marbel
5.	Iseilema nervosum	Munsel
6.	Microchloa indica	Chhaon
7.	Dendorcalamus strictus	Bans
8.	Colebrookea oppositifolia	Kalabans

Buffer zone

Trees:

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S. No.	Botanical Name	Local Name
1.	Acacia catechu	Khaira
2.	Acacia leuophloea	Hiwar
3.	Adina cordifolia	Haldu
4.	Aegel marmelos	Bela
5.	Ailanthus excels	Maharukh
6.	Albizzia labbek	Kala Sirisa
7.	Anogeissus pendula	Kardhai
8.	Albizzi aprocera	Karahi
9.	Azadiraachta indica	Neem
10.	Bauhinia malabarica	Amti
11.	Bridellia retusa	Kasai
12.	Anthosephalus cadamba	Kadamba
13.	Bombax ceiba	Semal
14.	Buchanania lanzan	Chiraonji
15.	Lannea grandis	Gunja
16.	Pterocarpus marsupium	Bija
17.	Bauhinia variegate	Kachnar
18.	Casearia tomentosa	Tondri
19.	Cassia fistula	Amaltas
20.	Chloroxylon swietenia	Bhirra
21.	Cleistanthus collinus	Garari
22.	Diospyros cordifolia	Bhak-tendu
23.	Butea monosperma	Palasa
24.	Caroya arborea	Kumbhigachha
25.	Casearia graveolens	Gilchi
26.	Biospyrus melanoxylon	Tendu
27.	Dalbergia sissoo	Sissoo
28.	Dalbergia latifolia	Shisham
29.	Dalbergia paniculata	Dhobin
30.	Ficus tomentosa	Sonpakad
31.	Embelica officinalis	Aonla
32.	Gmelina arborea	Gamari
33.	Ehretia laevis	Datranga
34.	Elaeodendron glaucucum	Jamrasi
35.	Ficus bengalensis	Bargad
36.	Magnifera indica	Mango
37.	Ficus religiosa	Pipal
38.	Tamarinudus indica	Imli
39.	Tactona grandis	Sagaun
40.	Syzygium cumini	Jamun
41.	Hymenodictyon excelsum	Mach
42.	Sorea robusta	Sal
43.	Schleichera oleosa	Kusum
44.	Lagerstroemia parviflora	Lendia
45.	Madhuca indica	Mahua

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Bushes:

S. No	Botanical Name	Local Name
1.	Kalangium sativifolia	Akol
2.	Andrographis paniculata	Bhui Neem
3.	Antidesma diandrum	Khatua
4.	Asparagus racemosus	Shatosi
5.	Celerodendron serratum	Duma
6.	Calotropis gigantean	Aak
7.	Carissa opaca	Karonda
8.	Flemingia semilata	Ban Rahar
9.	Cassio auriculata	Takhad
10.	Gardenia gummigera	Dikmali
11.	Gardewa lucida	Paprel
12.	Gardenia turgida	Phendra
13.	Curcuma longa	Hardi
14.	Desmodium gangeticum	Chapti
15.	Desmodium laxiflorum	Latkani
16.	Desmodium motorium	Rolei
17.	Dodoneae viscosa	Kharata
18.	Embelica robusta	Baibirang
19.	Eranthemum pulchellum	Bantulsi
20.	Gerwia hirsute	Gutdukti
21.	Gymnosporti spinosa	Baikal
22.	Peucamum nagpurense	Bandhania
23.	Hibisucus ficulenus	Banbhendi
24.	Swertia angustifolia	Chiraita
25.	Leea marcrophylla	Hathikanda
26.	Zizphus rugosa	Churna
27.	Gerwia rothii	Bansuli
28.	Meghania semilata	Banrahar
29.	Murraya exotica	Ban Mirchi
30.	Holarrhena antidysentrica	Dhuri
31.	Indigofera arborea	Neel

Shurbs

S. No.	Botanical Name	Local Name
1.	Abrus precatorlus	Gunja

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2.	Acacia aesia	Chil Badi
3.	Acacia pennata	Chil Choti
4.	Asparagus racemosus	Shatoori
5.	Butea parviflora	Nasbel
6.	Butea superba	Palasbel
7.	Calamus viminalis	Bet
8.	Capparis zeylanica	Waghoti
9.	Combretum decandrum	Piverbel
10.	Dioscorea belophylla	Kadukanda
11.	Dioscorea hispida	Baichandi
12.	Discorea pentaphylla	Musalkand
13.	Lechbocarpurs ferutescens	Dhimar bel
14.	Jasminum multiflorum	Kund
15.	Milllettae auriculata	Gauj
16.	Melothria heterophylla	Tondri
17.	Mucuna prurita	Kanchkuri
18.	Smilax zeylanica	Ramdaton
19.	Spatholobus roxburghii	Baghankhi
20.	Symphorema polyandrum	Chitaki
21.	Tinospera cordifolia	Giloh
22.	Ventilage calyculata	Keoti
23.	Vitis repanda	Daker bel
24.	Vitis tomentesum	Deto
25.	Zizphus oenoplia	Makor
26.	Zizphus rugosa	Kantakuli

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Epiphytes

Sl. No.	Botanical Name	Local Name
1.	Vanda roxburghii	Vanda

Parasites

Sl. No.	Botanical Name	Local Name
1.	Cuscuta reflexa	Amarbel
2.	Loranthus longifloris	Bandar
3.	Viscum articulatum	Viscum

Grass

Sl. No.	Botanical Name	Local Name
1.	Andropogon bumilus	Dalphulia
2.	Aristida setaceae	Bargi ronda
3.	Arudinella setosa	Sidi
4.	Cympopogon martini	Rosa ghans
5.	Cynodon dactylon	Doob
6.	Dichantium annalatum	Chhoti marbel
7.	Dichantium caricosum	Moti Marbel
8.	Eragrostis interrupta	Gondola
9.	Eragrostis tenella	Bhur Bhusi
10.	Heteropogon contortus	Kushal
11.	Iseilema nervosum	Munsel
12.	Microchloa indica	Chhaon
13.	Imperata cylindrical	Chhir
14.	Saceharum spoutaneum	Kans
15.	Seraria verticitata	Latkani
16.	Sorghumhalepense	Baru

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17.	Themeda arundinaceae	Drkhna
18.	Themeda inderbis	Gumar
19.	Themeda quadrivalvis	Gunher
20.	Thysanolacns maxima	Phubari
21.	Vetiveria zizanoides	Khas
22.	Dendorcalamus strictus	Bans
23.	Oxytenanthera nigrociliate	Panibans
24.	Colebrookea opsitifolia	Kalabans

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LIST OF FAUNA
CORE ZONE

Wild Animals:

Sl. No.	Local Name	English Name	Zoological Name	Schedule
1.	Bandar	Common Langur	Persbytis entellus	II
2.	Bhediya	Nold	Canis lumpus	II
3.	Chuha	Field Rat	Bendicota Bengalensis	IV
4.	Monitor Lizard	Monitor Lizard	Varanus monitor	IV
5.	Jangli kutta	Indian Wild Dog	Coun alpinus	II
6.	Khargosh	Indian Hare	Lepus nigricollis	IV
7.	Newala	Common Mongoose	Herpestes edwardsi	IV
8.	Sahi	Indian Perpupine	Hystrixindica	IV
9.	Chuhamar Sap	Rat snake	Ptyas mucosus	II

Birds

Sl. No.	Local Name	English Name	Zoological Name
1.	Bater lowwa	Langie bush quail	Perdual asiatica
2.	Bater	Grey quail	Cauturnix coturnix
3.	Baya	Baya weaver bird	Poceus philippinus
4.	Bulbul	Red vented bulbul	Pyconotus cafer
5.	Chakwa	Chakwa	Tadorna ferruginea
6.	Cheel	Common pariah kite	Milvus migrans
7.	Dudharaj	Paradise flycatcher	Tripsiphone paradise
8.	Gauriyya	House sparrow	Passer domesticus
9.	Ghughu	Indian great horned owl	Bubo bubo
10.	Haria	Common green pegion	Treron phoenicoptera
11.	Jangli kawwa	Indian jungle crow	Corvus marcrothychos
12.	Koyal	Koel	Cudynamys scolopacea
13.	Jangali murgi	Red jungle fowl	Gallus gallus
14.	Kabutar	Blue rock pegion	Columba livia
15.	Kali myna	Bastar Hill mayna	Grecula religiosa
16.	Katphora	Yellow fronted wood pecker	Picoides mahrattensis

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Buffer Zone

Wild Life

Sl. No.	Local Name	English Name	Zoological Name	Schedule
1.	Badar	Rhesus macaque	Macaca mullata	II
2.	Bandar	Common Langur	Persbytis entellus	II
3.	Sahi	Indain perpupine	Hystrixindica	IV
4.	Chital	Spotted deer	Axis axis	III
5.	Chuchundar	Grey musk shrew	Sunsus murinus	IV
6.	Chuha	Field Rat	Bendicota bengalensis	IV
7.	Kotri	Barking Dear	Muntiacus muntjak	III
8.	Gilhari	Three striped squirrel	Funambulus pennant	II
9.	Sambhar	Sambhar	Cervus unicolor	III
10.	Khargosh	Indian hare	Lepus nigricollis	IV
11.	Newala	Common mongoose	Herpestes edwardsi	IV
12.	Siyar	Jackle	Canis aureus	II
13.	Nilgai	Blue bull	Boselaphus tragocamwlus	III
14.	Krait	Common krait	Bungamus caeruleus	II
15.	Dev sap	Bandid krait	Bungamus	II
16.	Monitor Lizard	Monitor lizard	Varanus monitor	IV
17.	------	Catla	Catla catla	------
18.	----	Chanda	Chanda ranga	----------
19.	----------	Magur	Claris batrachus	-------
20.	----------	Nandus	Nandus nandus	---------
21.	----------	Punti	Puntius sarana	,,,,,,,,

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Birds

Sl. No.	Local Name	English Name	Zoological Name
1.	Kowwa	House crow	Carvus splondens

2.	Baya	Baya weaver bird	Poceus philippinus
3.	Kabutar	Blue rock pegion	Columba livia
4.	Fakhta	Spotted dove	Streptopelia chinensis
5.	Bulbul	Red vented bulbul	Pycontus cafer
6.	Bhujanga	King crow	Dicrurus admisiils
7.	Choltra bill	Common gray horn bill	Tockus birostris
8.	Chakwa	Chakwa	Tadorna ferruginea
9.	Chaha	Common snipes	Capella gallinage
10.	Cheel	Common pariah kite	Milvus migrans
11.	Haria	Common green pigeon	Treron phoenicoptera
12.	Chhika	Common indian nightjar	Caprimulgus asiaticus
13.	Chhota kilkila	Small blueking fisher	Alcedo atthis
14.	Gauriyya	House sparrow	Passer domesticus
15.	Dudharaj	Paradise flycatcher	Tripsiphone paradise
16.	Chalotra	Malbar gray horn bill	Tockus griseus
17.	Chhota basantha	Copper smith	Megalaima-haema cephala
18.	Gai – bagula	Cattle egret	Bulbulcus ibis
19.	Ganga – Myna	Bank mayna	Acridotheres ginginianus
20.	Crimson	Crimson throated barbet	Mugalaima ruvri capcita
21.	Ghghu	Indian great horned owl	Bubo bubo
22.	Jangli choghad	Barred jungle owler	Glaucidium rediatum
23.	Girria	Cotton teal	Nettapus coromadelianus
24.	Jangli kawwa	Indian jungle crow	Corvus macrothychos
25.	Hoopoe	Hoopoe	Upera epops
26.	Katphora	Great black back wood pecker	Dryocopur javensis
27.	Jangali murgi	Red jungle fowl	Gallus gallus
28.	Jangali murgi	Grey jungle fowl	Gallus sonneratii
29.	Kali myna	Bastar hill myna	Grecula religiosa
30.	Katphora	Black backed wood pecker	Chrysocoloptes festivus
31.	Katphora	Indian golden back wood pecker	Dinopium javensis
32.	Katphora	Yellow fronted wood pecker	Picoides mahrattensis
33.	Katphora	Rufous wood pecker	Microptimus brachyurua
34.	Katphora	Pigmy wood pecker	Picoides nanus
35.	Myna	Indian myna	Acridotheres tristis
36.	Katphora	Lisser golden back wood pecker	Dinopium bengalensis
37.	Koyal	Koel	Eudynamys scolopacea
38.	Nukri	Indian curser	Cursorius coromandelicus
39.	Nukri jerdon	Jerdon	Cursorius bitorquatus
40.	Navrang	Indian pitta	Pitta brachyuran
41.	Padki	Ring dove	Streptopelia dicaocto
42.	Padki	Spotted dove	Streptopelia ohinensis

Photo 1

Mr. [illegible] Jha
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Villagers using the road and stream water for cultivation

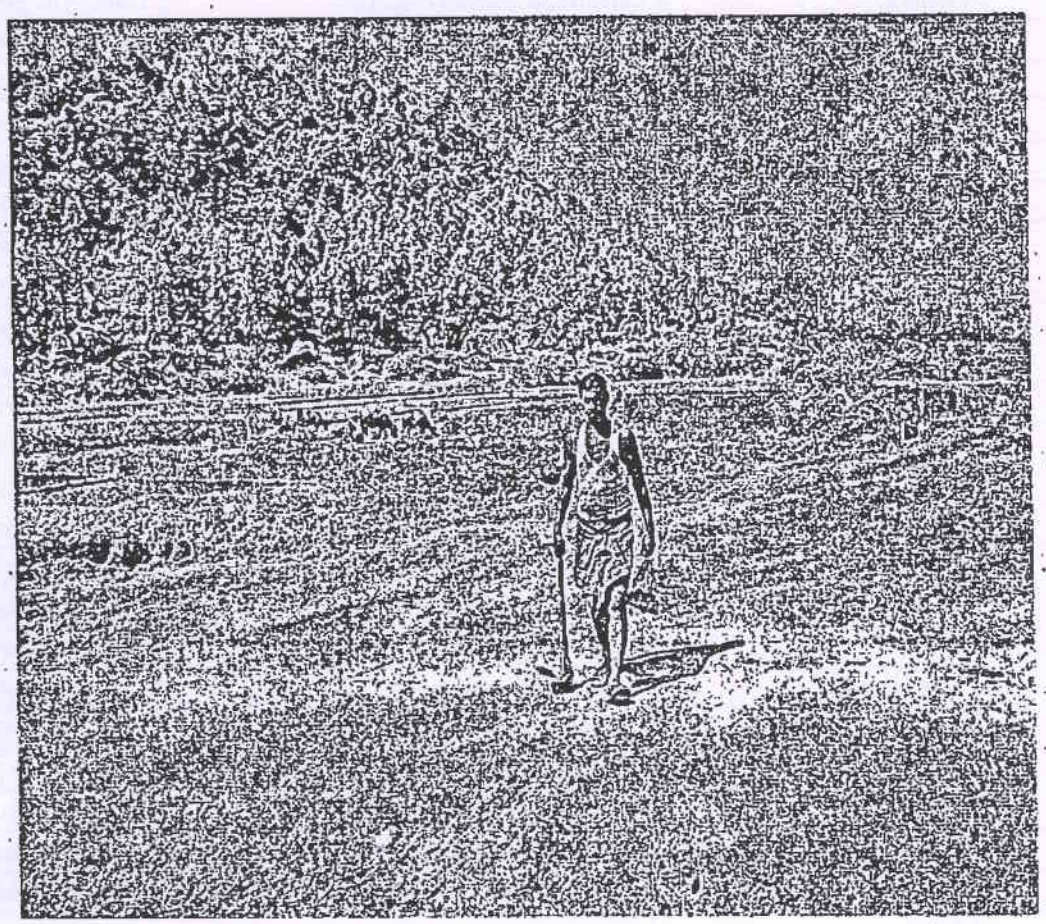

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Photo 2

Village well by the side of the stream bed and forest area

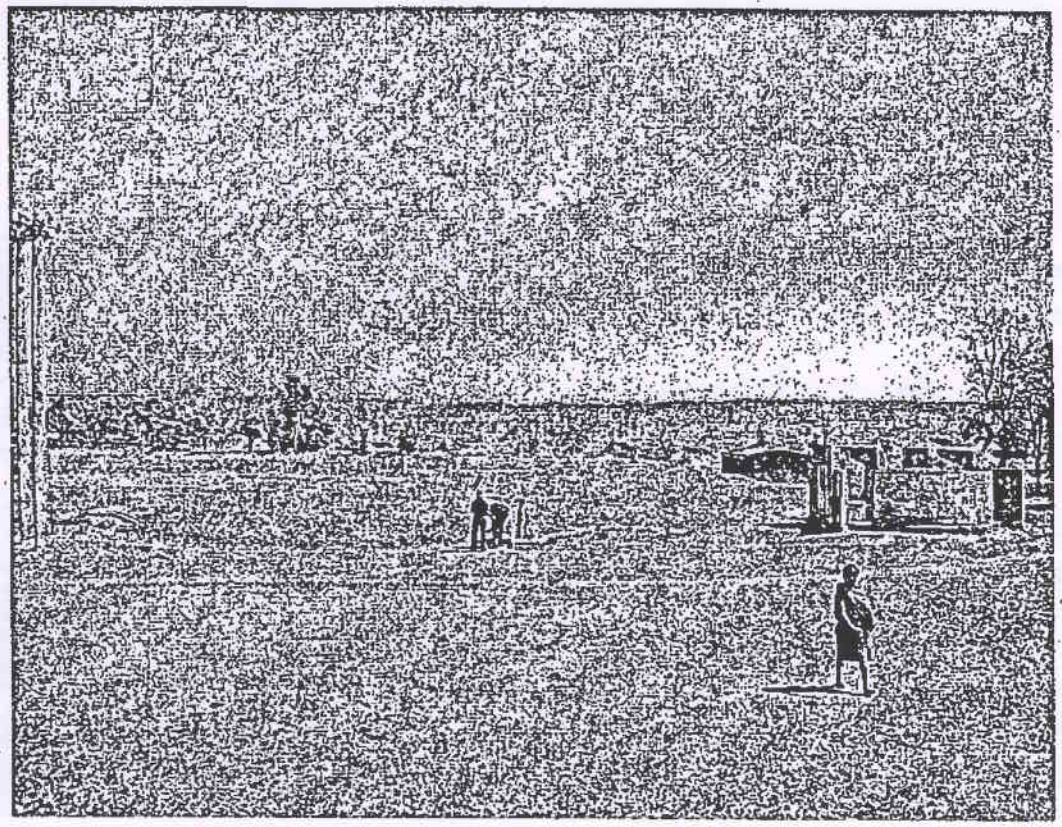

Photo 3

The degraded forest condition in the background of the stream

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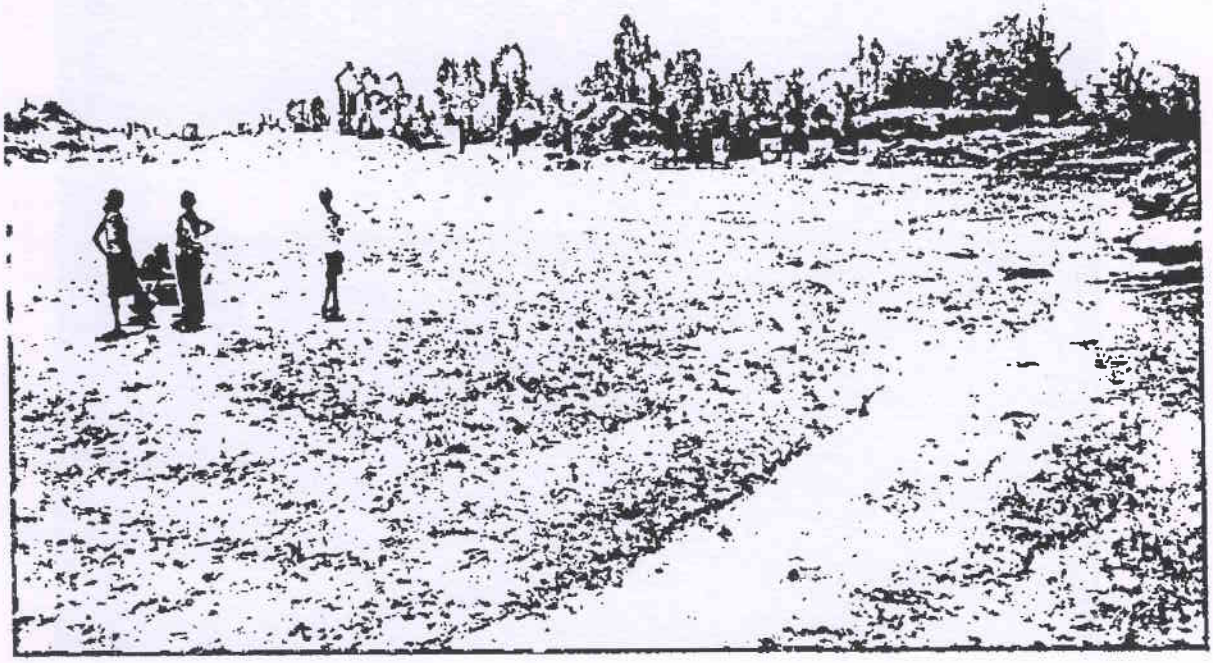

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Photo 4

Agriculture land by the side of bushy growth of forests

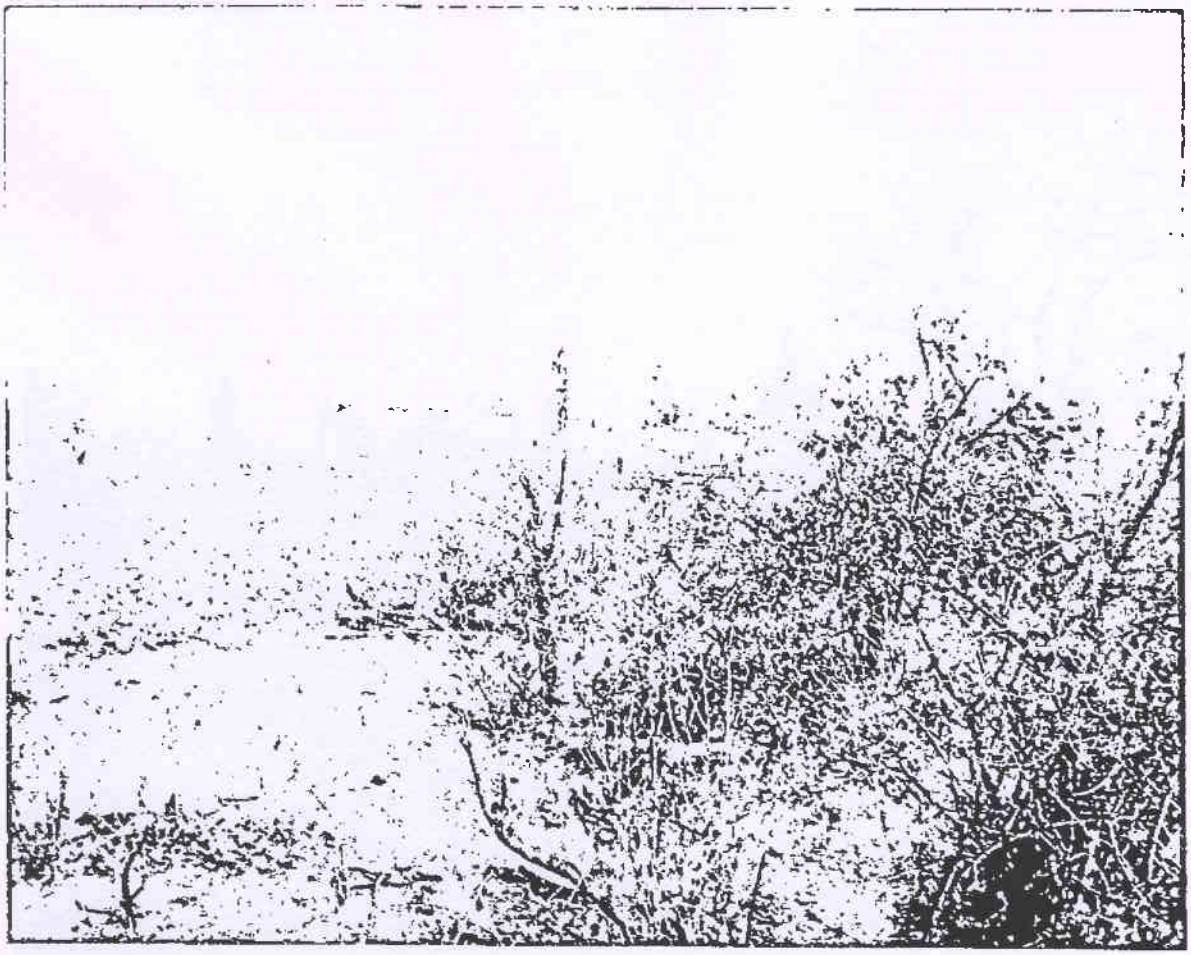

Photo 5

Degraded forest condition with Sal rooted waste

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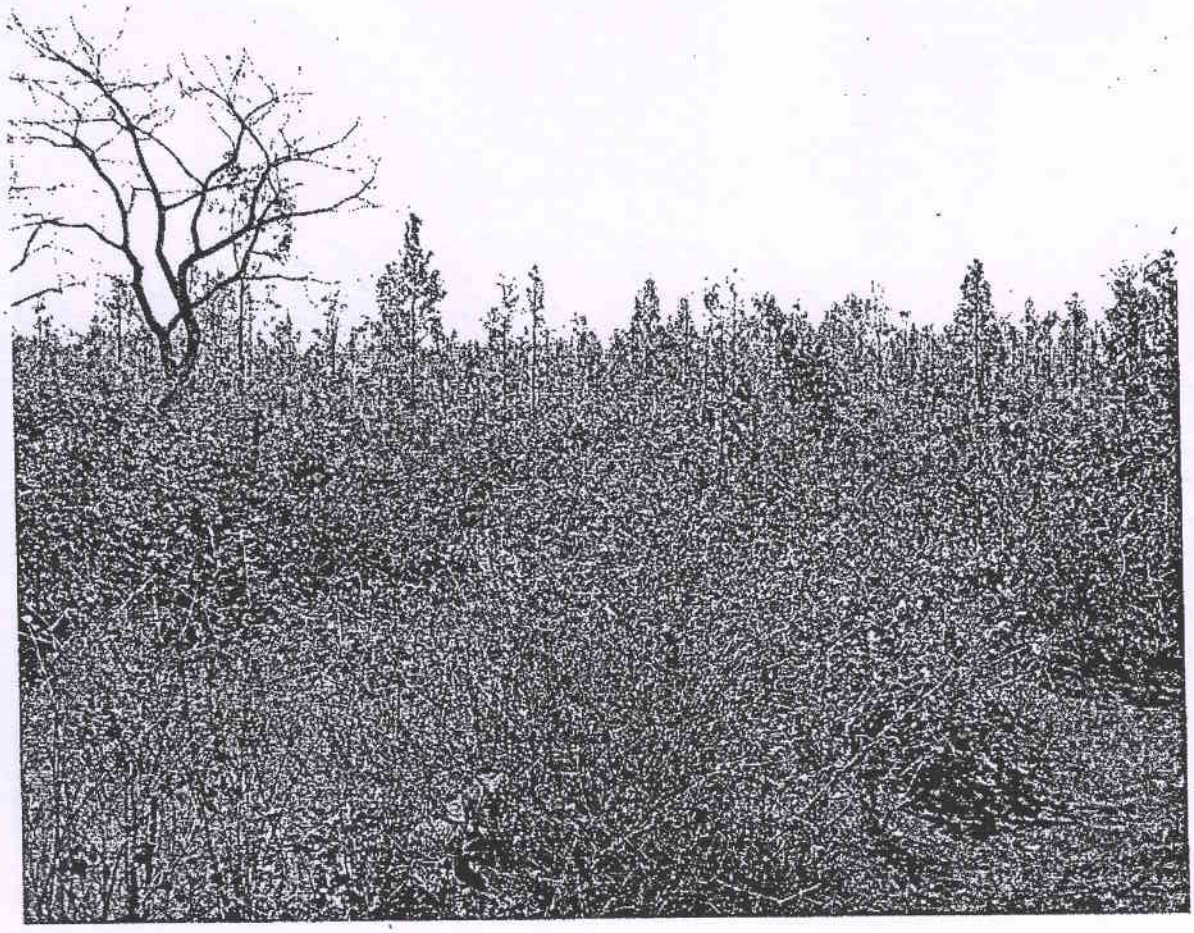

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Photo 6

Fair weather road passing through forest

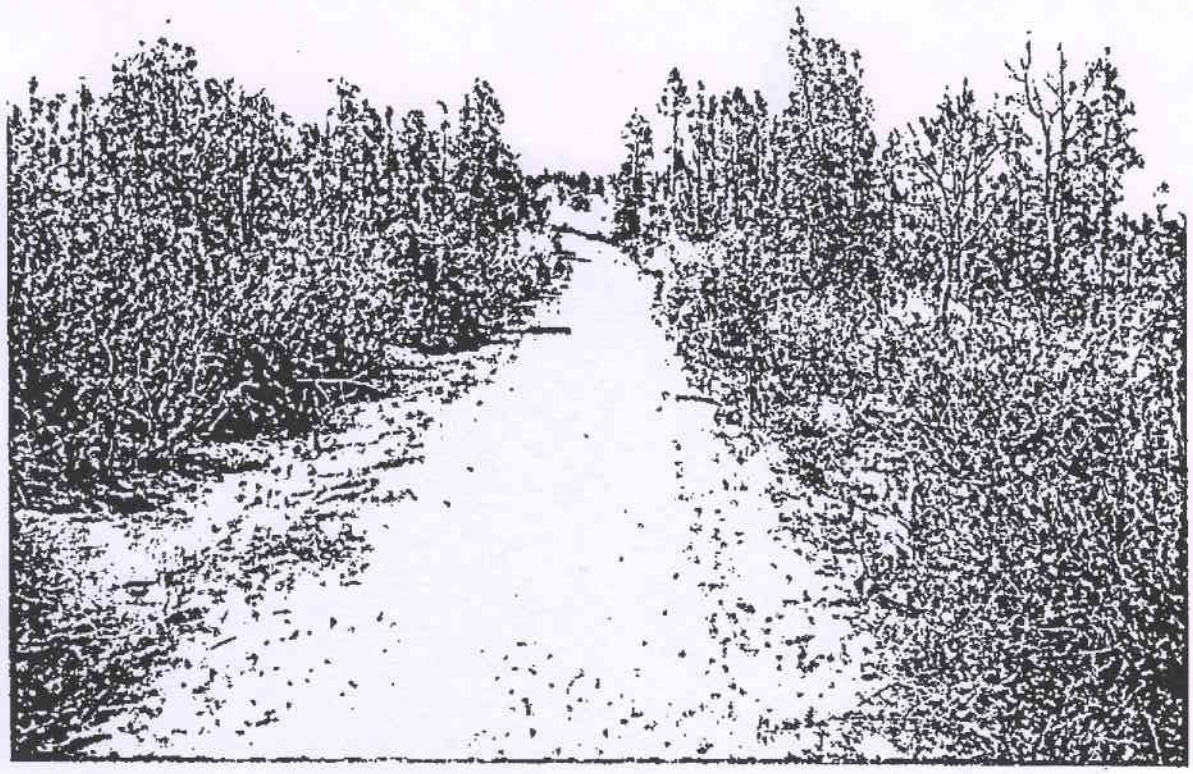

Photo 7

Degraded Forest with Lantana growth

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Photo 8

Water Body, Agriculture land and the hillock showing coppice Sal forest

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Photo 9

Photo showing converted fire wood ready for head loading

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Photo 10

Showing degraded forest condition with isolated Sal crop

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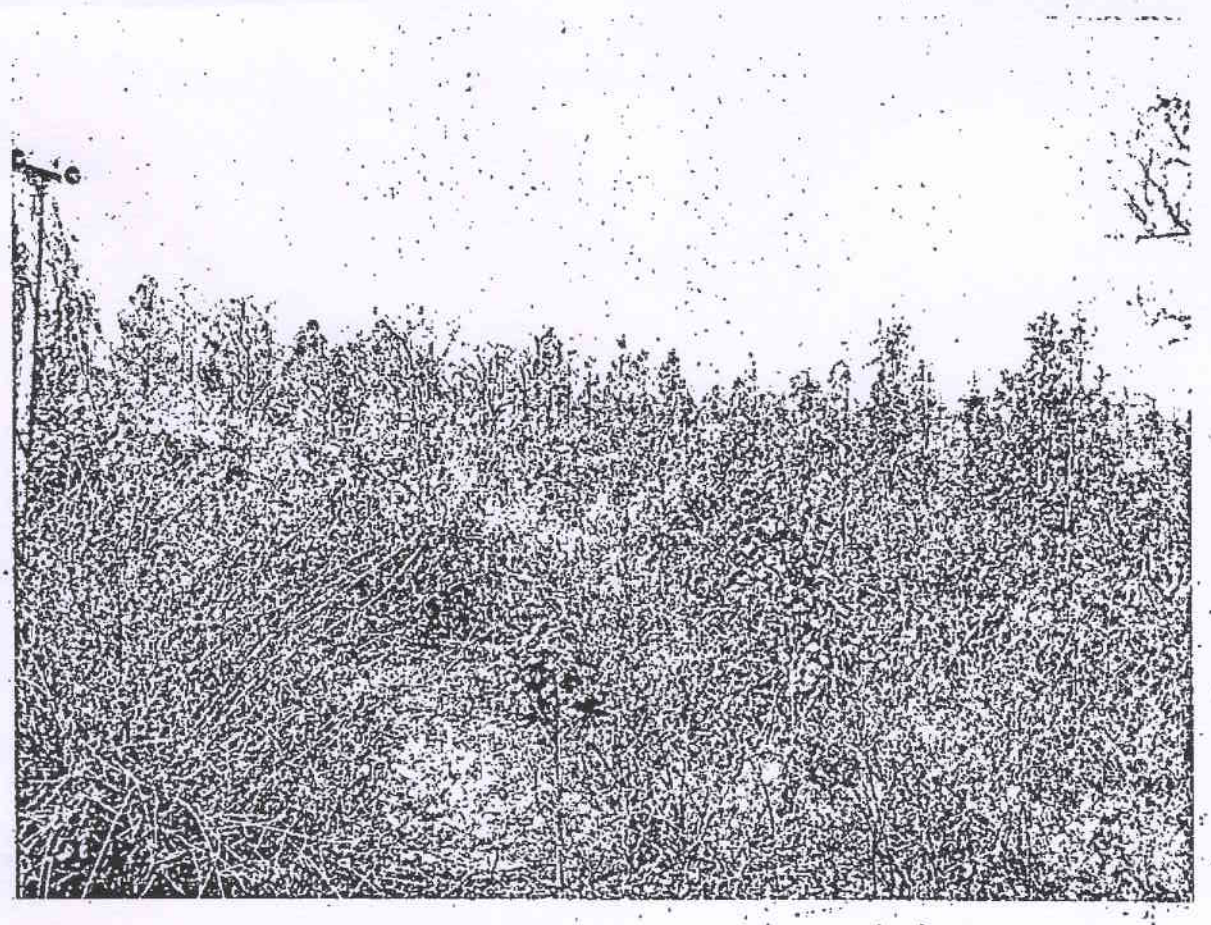

Photo 11

The village road and electric line passing through the forest

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Photo 12