ODISHA THERMAL POWER CORPORATION LIMITED

(A joint venture company of Odisha Hydro Power Corporation Ltd. and Odisha Mining Corporation Ltd.)

Regd. /Corp. Off.: 3RD FLOOR, SETU BHAVAN, PLOT-3(D), OBCC BUILDING, NAYAPALLY, BHUBANESWAR-12

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No.OTPC-TECH-52/2019/V1/P2/ 126 Date 05.04.2019

To,
Member Secretary, (Thermal Power)
Ministry of Environment, Forest & Climate Change, (IA Division)
Indira Paryavaran Bhavan,
Jor Bagh Road, Aliganj, New Delhi-110 003

Sub: Submission of Replies to Additional Details Sought (ADS) by EAC for grant of Environmental Clearance for "Proposed 3x800 MW Super-Critical TPP at Village Annupurna Khamar, Taluk Kamakhyanagar, Dhenkanal Distt., Odisha by M/s. Odisha Thermal Power Corporation Ltd"

Ref: MoEFCC Letter no.J-13012/43/2012-IA.II (T) dtd.22/03/2019
Proposal no: IA/OR/THE/10522/2012
MOEFCC File no: J-13012/43/2012-IA.II (T)i

Dear Sir,

Kindly refer to above MoEF&CC letter dtd. 22/03/2019 advising us to furnish additional information in order to grant Environment Clearance for 3x800 MW coal based Super-Critical Thermal Power Plant at village Annapurnapur Khamar, Taluk Kamakhyanagar, Dhenkanal Dist, Odisha.

The additional information sought are as follows:

1. The map authenticated by State Wildlife Department showing distance between elephant corridor, project boundary, the geographical extent of Schedule-I and II species in and around the project area. Details of number of each species recorded in the impact zone.
2. Details of greenbelt proposed in the project and in the wildlife management plan along with the map indicating the length, width and coordinates of the proposed greenbelt.
3. Details of air quality modeling shall be presented. The emissions of SOx in case of failure of FGD for three units may be re-calculated. Further, the emissions may be calculated for stack height of 275 m, 100 m and as per the formula provided in the Ministry's Notification dated 28.06.2018. It should also take into account of exit velocities of the flue gas.
4. Off set plan for cutting 13,264 trees in non-forest area and 2,829 trees in the forest area.

We are hereby enclosing replies to all the required information as asked by EAC. You are therefore requested to kindly consider our application for grant of Environmental Clearance.

Thanking you

Yours faithfully,
For OTPC Limited

(B.S. Panda)
Chief Executive Officer

Encl.: As above.

ADDITIONAL DETAILS SOUGHT BY EAC

The proposal for Environmental Clearance for 3x800 MW Super-Critical TPP at village Annupurna Khamar, Taluk Kamakhyanagar, Dhenkanal Distt., Odisha by M/s. Odisha Thermal Power Corporation Ltd was considered in the 6th meeting of the re-constituted Expert Appraisal Committee (EAC) on Environmental Impact Assessment (EIA) of Thermal Power Projects held on 29th May, 2017 in the Ministry of Environment, Forest & Climate Change, Indira Paryavaran Bhawan, New Delhi.

After detailed deliberation, the EAC deferred the project and sought some additional information in the form of ADS. The replies to the ADS were submitted and the proposal was reconsidered in the 14th meeting of the re-constituted Expert Appraisal Committee (EAC) on Environmental Impact Assessment (EIA) of Thermal Power Projects held on 12th January, 2018. After detailed deliberation, the EAC deferred the project and sought some additional information in the form of ADS (2).

The replies to the ADS (2) were submitted and the proposal was reconsidered in the 25th meeting of the re-constituted Expert Appraisal Committee (EAC) on Environmental Impact Assessment (EIA) of Thermal Power Projects held on 22nd February, 2019. The proposal was deferred by EAC for want of following additional information:

Point 25.3.4 (i): The map authenticated by State Wildlife Department showing distance between elephant corridor, project boundary, the geographical extent of Schedule-I and II species in and around the project area. Details of number of each species recorded in the impact zone.

Point 25.3.4 (ii): Details of greenbelt proposed in the project and in the wildlife management plan along with the map indicating the length, width and coordinates of the proposed greenbelt.

Point 25.3.4 (iii): Details of air quality modelling shall be presented. The emissions of SOx in case of failure of FGD for three units may be re-calculated. Further, the emissions may be calculated for stack height of 275 m, 100 m and as per the formula provided in the Ministry's Notification dated 28.06.2018. It should also take into account of exit velocities of the flue gas.

Point 25.3.4 (iv): Off set plan for cutting 13,264 trees in non-forest area and 2,829 trees in the forest area.

Point wise reply to above details are given in the following paragraphs-

Point 25.3.4 (i): The map authenticated by State Wildlife Department showing distance between elephant corridor, project boundary, the geographical extent of Schedule-I and II species in and around the project area. Details of number of each species recorded in the impact zone.

A jointed survey of India Toposheets bearing No. F45 T5, F45 T9, F45 T10 , F45 T6 showing part of Maulabhanja-Jiridimali–Anantapur identified Elephant corridor passing through the northern fringe of project impact area and showing distances between elephant corroder, project boundary, the geographical extent of schedule-I & II species in and around the project area is enclosed as **Annexure-I.** Besides State Wildlife map of Odisha showing the distances of protected areas, elephant corroder from the project site is also enclosed as **Annexure-II.**

The distances of the elephant corridor from the boundary of the project are 13.9 KM & 13.85 KM respectively from two extreme ends.

The forest blocks as mentioned below occurring in the project impact area constitute the habitat of schedule-I & II species. The location of those blocks find place on Survey of India topo sheets mentioned above. However, the distances of the forest blocks hosting schedule-I & II species are furnished as under :

1) Sunajhari RF : 2.7 KM
2) Machnia RF : 4.2 KM
3) Anantapur RF : 13.46 KM
4) Suniamaru RF : 1.90 KM
5) Sunderakhol RF : 0.390 KM
6) Kadalipal RF : 1.8 KM

Schedule I fauna like elephant move from one forest block to other in search of food & water. Usually they migrate from Anantapur RF, Kapilash Wildlife sanctuary mentioned in the plan to the project impact area. All other schedule-I & II species mentioned in the plan are available sporadically in the above forest blocks with very low density due to various anthropogenic pressures.

No such systematic census of wildlife except elephant and bird has been conducted in the recent past in the impact zone. As narrated in para-4 of page-21 a census conducted during 2003 January in Kamakhyanagar West Range is as under.

Sl. No.	Local Name	Scientific Name	No.
1	Hyena	Hyaena hyaena	05
2	Bear	Ursus ursinus	03
3	Wild boar	Sus serofa	11
4	Spotted deer	Axis axis	20
5	Sambar	Cervus unico	19
6	Barking deer	Muntiacus muntjack	20
7	H.L.Langur	Presbytis entellus	25

8	Pereupine	Hystrix indica	30
9	Mongoose	Herpestes edwardii	35
10	Gaint squirrel	Rutufa bicolar	50
11	Jackle	Canis aureus	210
12	Mouse deer	Tragulus meminna	20
13	Peafowl	Pavo cristalus	140

The last elephant census and bird census (2018-2019) conducted in the project impact area under Kamakhyanagar West Range are as under :

Elephant Census

Name of Range	Adult Bulls more than 8′ (>240 cm)			Adult Cows > 7′ (>210 cm)	Sub-Adult Bulls (5′ to 8′) 151-240 cm.			Sub-Adult Bulls (5′ to 7′) 151-210 cm.	Adult/sub-Adult Unknown sex				Luvenile (4′ to 5′) 121-150 cm)	Calf (less than 4′)	Total Youg	Grand Total
Kamakhyanagar West Range	6	-	6	13	-	-	-	-	-	-	4	4	-	4	-	27

Birds Census

Sl. No.	Name of the Species	No. of Birds
1	Little cormorant P. nagar	1600
2	Ibises & Spoonbills	100
3	Brahminy Ruddy shelduck Padoma ferrugineas	50
4	Kingfisher	300
5	Others	7
	Total	**2057**

As the project area comprises very thin vegetation and is nearer to Sundarakhol RF, wildlife occasionally move inside the forests of project area during night time for forage purpose.

Point 25.3.4 (ii): Details of greenbelt proposed in the project and in the wildlife management plan along with the map indicating the length, width and coordinates of the proposed greenbelt.

Development of green belt, mentioned in Wildlife Management Plan is a part of green belt already proposed in the project area no separate green belt has been considered. Only mention in the Wildlife Management Plan again in view of the guidelines of PCCF (WL) cum CWLW, Odisha

Details of green belt proposed in the main plant area consisting of 13 patches along with details of length, width & GPS co-ordinates are as under:

Sl. No. of patch	Length in meter	Average width in meter	Starting/ Ending points	Latitude	Longitude
I	2640	108	Starting	$20^0$50′1.2″	$85^0$31′39.2″
			Ending	$20^0$50′43.2″	$85^0$30′43.5″
II	990	62	Starting	$20^0$50′39.1″	$85^0$30′39.3″
			Ending	$20^0$50′10.7″	$85^0$30′40.6″
III	2110	132	Starting	$20^0$50′15.0″	$85^0$30′42.5″
			Ending	$20^0$49′31.8″	$85^0$31′11.2″
IV	447	90	Centre	$20^0$49′44.7″	$85^0$31′27.6″
V	655	78	Starting	$20^0$49′47.9″	$85^0$31′36.1″
			Ending	$20^0$50′17.1″	$85^0$31′36.8″
VI	530	50	Centre	$20^0$50′14.8″	$85^0$31′21.2″
VII	637	48	Starting	$20^0$50′14.1″	$85^0$31′35.3″
			Ending	$20^0$50′31.7″	$85^0$31′32.1″
VIII	580	112	Starting	$20^0$50′17.6″	$85^0$31′28.9″
			Ending	$20^0$50′34.1″	$85^0$31′28.2″
IX	377	34	Centre	$20^0$50′39.7″	$85^0$31′18.0″
X	694	71	Centre	$20^0$50′40.4″	$85^0$30′57.8″
XI	880	80	Starting	$20^0$50′37.3″	$85^0$31′9.3″
			Ending	$20^0$50′19.8″	$85^0$30′58.3″
XII	1314	48	Starting	$20^0$50′38.2″	$85^0$30′45.5″
			Ending	$20^0$50′18.2″	$85^0$31′10.9″
XIII	602	129	Starting	$20^0$50′22.7″	$85^0$30′42.5″
			Ending	$20^0$50′16.5″	$85^0$30′57.7″

A map indicating the 13 patches of green belt inside the main plant area is enclosed as **Annexure-III.**

Avenue plantation for 9 kms. comprising of indigenous ornamental, fruit bearing and shady species have been proposed to be taken up along the outside road proposed to be constructed outside the compound wall of the main plant and garland drain encircling the plant for safety and public tress pass and along both the side of Dhenkanal-

Kamakhyanagar State Highway between village Mahuli & Bijadiha adjoining to the plant boundary. Detail breakup as follows:

Patch-I	-	Along the boundary	:	3.60 KM
Patch-II	-	Along inside roads	:	2.00 KM
Patch-III	-	Along State Highway between Mahali & Bijadiha village	:	3.40 KM
		Total	:	9.00 KM

Point 25.3.4 (iii): Details of air quality modelling shall be presented. The emissions of SOx in case of failure of FGD for three units may be re-calculated. Further, the emissions may be calculated for stack height of 275 m, 100 m and as per the formula provided in the Ministry's Notification dated 28.06.2018. It should also take into account of exit velocities of the flue gas.

OTPCL has proposed for installation of 3X800 MW coal based super critical thermal power plant with latest state of the art technologies. In order to limit SO_2 concentrations within specifies norms, OTPCL has proposed for installation of 3 nos of FGD systems, one in each units separately. The FGD Plant will be installed at the space provided behind the chimney. The FGD plant will reduce the SO_2 emission from the Steam Generator below 100 mg per Nm^3 (as per MoEF standard).

Details of model used:

In order to predict the impacts due to proposed plant, AERMOD modeling system is used. The USEPA AERMOD model was issued towards the end of 1998 and has replaced the ISCST3 model as the USEPA's standard dispersion model.

AERMOD is a steady-state plume model that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.

In the stable boundary layer (SBL), the concentration distribution is assumed to be Gaussian in both the vertical and horizontal direction. In the convective boundary layer (CBL), the horizontal distribution is assumed to be Gaussian, but the vertical distribution is described with a bi-Gaussian probability density function (p.d.f.).

Thus, it is applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including, point, area and volume sources).

The most important feature of the AERMOD model over ISC model, is its modification of the basic dispersion model to account more effectively for a variety of meteorological factors. In particular it uses the Monin-Obukhov length scale rather than the Pasquill-Gifford stability categories to account for the effects of atmospheric stratification. However, it remains essentially a Gaussian model.

The modeling system consists of one main program (AERMOD) and two pre-processors (AERMET and AERMAP). The major purpose of AERMET is to calculate boundary layer parameters for use by AERMOD. The meteorological INTERFACE, internal to AERMOD, uses these parameters to generate profiles of the needed meteorological variables. In addition, AERMET passes all meteorological observations to AERMOD.

The growth and structure of the PBL is driven by the fluxes of heat and momentum, which, in turn, depend upon surface effects. Surface characteristics (land use) in the form of albedo, surface roughness and Bowen ratio, plus standard meteorological observations (wind speed, wind direction, solar radiation, temperature, and cloud cover), are input to AERMET. AERMET then calculates the PBL parameters: friction velocity, Monin-Obukhov length, convective velocity scale, temperature scale, and surface heat

flux (H). These parameters are then passed to the INTERFACE (which is within AERMOD).

Emissions of SO_2 in case of failure of FGD

The design and layout of steam generator and its auxiliaries will be such that a wet/dry flue gas desulphurization system can be installed, taking suction from duct after ID fan and feeding the de sulphurised flue gases back to the chimney with provision for bypassing the FGD system. In case of failure of FGD system, the entire flue gas containing SO_2 shall be by-passed directly to chimney. The worst case scenario has been studied for the above scenario.

As per the formula provided in the Ministry's Notification dated 28.06.2018, the minimum stack height is calculated as 100 m (>84.4 m).

However, OTPC has proposed for installation of a 275 m high tri-flue stack for proper dispersal of pollutants as per the prevailing guidelines. Since, the height of the stack is a design parameter, the same will not change even in worst case scenario. However, as desired by EAC, the dispersion modelling has been conducted for two scenarios, i.e. for 275 m and for 100 m.

For predicting the impacts of worst case scenario in case of failure of FGD system, the following assumptions have been considered in order to calculate the exhaust emissions:

1. During normal scenario, all the three FGD systems shall operate as usual, bringing down SO_2 concentration from flue gas of each stack to 100 mg/Nm^3 as per norms.
2. In case of FGD failure, the SO_2 content in exhaust flue gas shall be due to the total sulphur content of input coal.
3. Total SO_2 concentration in flue gas in absence of FGD system in each unit is estimated to be 1033 mg/Nm^3.

The summarized stack parameters for normal and emergency scenarios are summarized in **Table 1** below. The exit velocity of the flue gas is also considered and it is derived from the quantity of gas generated during coal combustion in boilers.

Table 1- Summarized stack parameters in different scenarios for one 800 MW unit

Sl. No	Parameter	Unit	Value
1	**Unit Production capacity**	**MW**	800
2	**Sp. heat rate**	**kcal/kwh**	2215
3	**CV**	**kcal/kg**	3280
4	**Total coal consumption**	**MTPA**	4.02
5	**PLF**	**-**	0.85
6	**Th. Coal Consumption**	**tph**	540.33
7	**Actual consumption**	**tph**	540.24
8	**Theoretical Air**	**Nm^3/kg of coal**	4.54
9	**Combustion Product**	**Nm^3/kg of coal**	5.18
11	**Flue Gas quantity**	**Nm^3/h**	3289005
12	**Exit Temp**	**°C**	140

Sl. No	Parameter	Unit	Value
13	**Diameter**	**m**	8
14	**Exit velocity**	**m/s**	25.18
15	**Stack Height**	**m**	275 and 100
17	**SO_2 Load – Normal**	**mg/Nm^3**	**100**
		g/sec	91.36
		Kg/hr	328.90
18	**SO_2 Load – FGD Failure** *(for 100 m as well as 275 m stack height)*	**mg/Nm^3**	**1033**
		g/sec	944
		Kg/hr	3398.4

Based on the above inputs, Ground Level Concentrations (GLCs) have been predicted due to the plant operation on ambient environment for worst case scenario. Following 4 scenarios have been considered –

A. **Normal Scenario 275 m stack –** All units are working normally.
B. **Emergency Scenario 275 m stack –** Two units working normally and FGD system of one unit has failed.
C. **Worst Case Scenario 275 m stack –** FGD system of all three units have failed simultaneously.
D. **Normal Scenario 100 m stack –** All units are working normally.
E. **Emergency Scenario 100 m stack –** Two units working normally and FGD system of one unit has failed.
F. **Worst Case Scenario 100 m stack –** FGD system of all three units have failed simultaneously.

The site-specific meteorological data generated during Post- monsoon season is used for impact prediction. The results of predicted GLCs at individual AAQ station are presented in **Table 2**.

Table 2: **Predicted ground level concentration at various receptor points**

Station ID	Distance from Plant Boundary (Km)	SO_2 ($\mu g/m^3$) 24hr Avg.					
		275 m Stack			100 m Stack		
		Normal	Emergency	Worst Case	Normal	Emergency	Worst Case
A1	0	5.81	23.86	59.98	8.59	35.31	88.75
A2	8.0 (E)	4.61	18.92	47.54	6.41	26.35	66.24
A3	0.8 (NNE)	7.47	30.66	77.06	9.77	40.18	100.98
A4	9.4 (NNE)	1.49	6.14	15.44	2.22	9.11	22.89
A5	0.8 (W)	6.49	26.67	67.02	8.55	35.14	88.33
A6	6.0 (WSW)	2.13	8.76	22.02	3.14	12.89	32.40
A7	5.7 (SW)	2.18	8.95	22.50	3.21	13.20	33.17
A8	0.9 (S)	5.93	24.34	61.19	7.97	32.78	82.39
Max.	1.2	9.63	39.60	99.53	306.8	1261.1	3169.8

Point 25.3.4 (iv): Off set plan for cutting 13,264 trees in non-forest area and 2,829 trees in the forest area.

A total of 38.098 ha. of forest area have been applied for diversion for the project. A total 13,264 nos. trees in non-forest land and 2,829 nos. forest land which are to be felled during project implementation.

1. **Offset plan for 13,264 trees to be felled**.

   The project proponent has proposed to plant two times the nos. of tree to be felled with indigenous species in consultation with the State Forest Deptt.

   Therefore, 2 x 13,264 nos. = **26,528 or say 26,600 nos. of trees** are to be planted in consultation with concerned Divisional Forest Officer and Divisional Manager of Odisha Forest Development Corporation, who will execute the plantation after obtaining required funds from the user agency i.e. OTPCL. A detail scheme is being prepared by the UA for approval by DFO, Dhenkanal and D.M., Dhenkanal.

   However, OTPCL has proposed to take up some plantations around their other infrastructures excluding the power plant area to enhance greenery to the site and from environmental point of view and along the roads etc. as per instruction of DFO, Dhenkanal vide 2334 dt.02.04.2015 and as per the scheme dt. 03.06.2015.

a) **Plantation on both the side of raw water corridor** : It is proposed to take up single row plantation on both the side of the corridor over a length of about 7 KM with a spacing of 2.5 meter i.e. 800 plants per KM totalling to **5,600 nos**.

   GPS location of the site

		Latitude	**Longitude**
Starting point	:	$20^0$48'53.5"	$85^0$29'14.5"
Ending point	:	$20^0$46'44.5"	$85^0$27'00"

b) It is proposed to take up double row plantation of indigenous species around the proposed **ash pond** having area 188.686 ha. and a length of around 11 KM with a spacing of 2.5m x 2.5m i.e. 800 plants per KM to strengthen the embankment of ash pond. The location of plantation is between latitude 20046'1.7" & longitude 85029'48.3" and all total **8,800 nos.** of seedlings will be planted there.

c) Also OTPCL proposes to develop greenery around its township and approach road from Dhenkanal-Kamakhyanagar State Highway by planting ornamental, fruit bearing and shady species.

   Single row plantation along the boundary of township over a length of 3 KM (spacing 2.5m x 2.5m). All total 1200 plants can be planted along the boundary and 800 in the open species inside the colony, and avenue from State Highway 1600 plants totalling to **3200 nos.** The GPS coordinate of the site is between latitude $20^0$48'45.00" & longitude $85^0$33'2.5"

d) As per instruction of DFO, Dhenkanal cited above OTPCL proposes to take up single row avenue plantation with a spacing of 2.5 meter on both the side and around the embankment of water bodies and along the following roads using flowering, fruit

bearing and shady species not only to add greenery to the sites but also from aesthetic point of view as detailed below.

Jhumparabandth & Kasibandh under Kamakhyanagar NAC	:		3,000 nos.
Bhalumunda & Kadalimunda village road	:	2.5 KM	
Dhobabahali to Kantapada village road	:	3.0 KM	
Kadalipal juangasahi to Kateni village road	:	2.0 KM	
Anla bereni to Jangasahi village road	:	2.0 KM	
Deulichouk to Dam site road	:	1.5 KM	
Kusumjodi to Panchayat office	:	1.0 KM	
Single row on either side at a spacing of 2.5 meter @ 800 plant/KM	:		9,600 nos.
Total	**:**	**12.0 KM**	**12,600 nos.**

Therefore, total plants proposed to be planted comes to **30,200** nos. against felling of 13,264 nos. of trees standing in non-forest land to compensate the loss of greenery and existing echo system to be caused due to project implementation. A detail scheme shall be prepared with budgetary provision after environment clearance is obtained. We undertake to deposit the cost of plantation in consultation with the DFO, Dhenkanal Division and DM, OFDC, Dhenkanal.

2. Offset plan for felling 2,829 nos. of trees occurring in forest land of the project.

To compensate the loss of forests from forest land of 38.098 ha. Comprising of 2,829 nos. of trees of different species, OTPCL have identified 38.458 ha. of non-forest land in three patches in village Kateni, Kantakhol and Jogidiha under Dhenkanal Forest Division for **Compensatory Afforestation** in lieu of diversion of forest land.

The compensatory afforestation scheme with a financial outlay of Rs.1,72,17,305/- duly prepared & approved in consultation with DFO, Dhenkanal/RCCF, Angul is attached as **Annexure-IV**. The Compensatory afforestation scheme duly approved by PCCF, Odisha along with the Forest Diversion proposal has been forwarded to F&E Deptt. Govt. of Odisha vide letter No.3849 dtd.01.03.2019 enclosed at **Annexure-V.**

OTPCL shall make e-payment in Adhoc-CAMPA on receipt of demand notice from the DFO, Dhenkanal and final approval from the Addl. PCCF (FD & NO FC Act.) O/o PCCF, Odisha. A total of 40,376 saplings shall be planted in these three patches along with other silvicultural operations of existing species and soil and moisture conservation measures.

Survey of India Toposheet showing the location of the above patches is enclosed here with as **Annexure-VI** for the kind appreciation of EAC.

Annexure 1

LEGEND

INDEX

- MAIN PLANT AREA
- BOUNDARY OF BUFFER ZONE
- ASH POND
- TOWNSHIP
- INTAKE WELL
- PORTION OF MAULABHANJA-JIRIDAMALI-ANANTAPUR IDENTIFIED ELEPHANT CORRIDOR

PLATE - I

Prepared by:-

GGCPL Patia, BBSR
On Behalf of
OTPCL

MAP SHOWING THE DISTANCES BETWEEN ELEPHANT CORRIDOR, PROJECT BOUNDARY, THE GEOGRAPHICAL EXTENT OF SCHEDULE-I & II SPECIES IN AN AROUND THE PROJECT AREA OF OTPC THERMAL POWER PLANT AT KAMAKHYANAGAR ON SURVEY OF INDIA TOPOSHEET NO.F45T5,F45T6,F45T9,F45T10,F45N8 & F45N12 IN DHENKANAL DISTRICT OF ODISHA

SCALE-1:50,000

Annexure II

WILDLIFE MAP OF ODISHA SHOWING THE DISTANCES OF OTPCL THERMAL POWER PLANT NEAR KAMAKSHYA NAGAR IN DHENKANAL DISTRICT FROM THE NEAREST SANCTUARIES / NATIONAL PARK AND ELEPHANT / TIGER RESERVE AND THEIR CORRIDORS.

Scale : 30 0 30 60 Kilometers

LEGEND

- Plant Area
- Elephant Corridor
- Elephant Corridor(Central India)
- Railways
- National Highways
- District Boundary
- Wildlife Sanctuaries/National Parks
- Major Rivers
- Mayurbhanj Elephant Reserve
- Sambalpur Elephant Reserve
- Mahanadi Elephant Reserve

List of Sanctuaries / National Parks / Tiger Reserves / Elephant Reserves in Orissa

Sanctuaries
1. Bhitarkanika
2. Similipal
3. Satkosia Gorge
4. Hadgarh
5. Nandankanan
6. Baisipalli
7. Kotagarh
8. Chandaka-Damapara
9. Khalasuni
10. Balukhand-Konark
11. Kuldiha
12. Debrigarh
13. Lukhari Valley
14. Chilika (Nalaban)
15. Badrama
16. Sunabeda
17. Karlapat
18. Gahirmatha (Marine)
19. Kapilas Wildlife Sanctuary

National Park
1. Similipal
2. Bhitarakanika

Tiger Reserve
1. Similipal

Elephant Reserve
1. Mayurbhanj Elephant Reserve
2. Sambalpur Elephant Reserve
3. Mahanadi Elephant Reserve

JHARKHAND, SUNDARGARH, JHARSUGUDA, SAMBALPUR, DEBRIGARH, CHATTISGARH, BARAGARH, SONPUR, BOUD, BOLANGIR, SUNABEDA, NUAPADA, KALAHANDI, NABARANGAPUR, KARLAPAT, RAYAGADA, KORAPUT, MALKANGIRI, ANDHRA PRADESH, GAJAPATI, GANJAM, DEOGARH, KEONJHAR, ANUGUL, DHENKANAL, BADRAMA, KHALASUNI, SATKOSHIA GORGE, BAISIPALLI, PHULBANI, CUTTACK, JAJPUR, BHADRAK, BALASORE, MAYURBHANJ, SIMILIPAL, HADGARH, KULDIHA, BHITARKANIKA, GAHIRAMATHA, KENDRAPADA, MARINE SANCTUARY, JAGATSINGHPUR, NANDANKANAN, KHURDHA, NAYAGARH, PURI, CHANDAKA DAMAPARA, BALUKHANDA-KONARK, KOTGARH, LUKHARI VALLEY, NALABAN, BAY OF BENGAL

Elephant Corridor (Central India)

Tiger Reserve

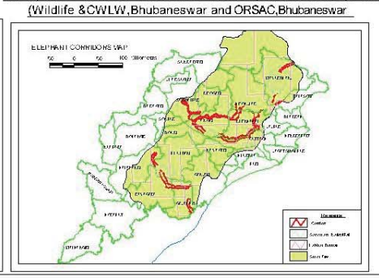
Plant Location

129.78 Km, 99.87 Km, 71.47 Km, 67.35 Km, 172.01 Km, 101.71 Km, 110.80 Km, 192.38 Km, 31.66 Km, 50.91 Km, 47.38 Km, 50.91 Km, 122.13 Km

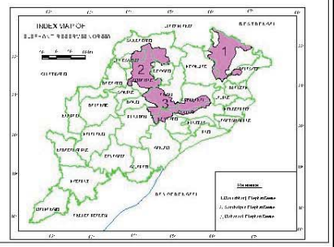
ELEPHANT CORRIDORS			
SL NO	DESCRIPTION		
1	BADAMPAHAR-DHOBADHOBANI	8	KANHEIJENA-ANANTPUR
2	BADAMPAHAR-KARIDA	9	BUGUDA-CENTRAL RF OF NAYAGARH DIVISION
3	WEST BENGAL-DEULI-SULIAPADA	10	NUAGAON-BARUNI
4a 4b	SIMILIPAL-HADGARH-KULDIHA	11	TAL-KHOLGARH
5	TELKOI-PALLAHADA	12	BARPAHAD-TARAVA-KANTAMAL
6	KARO(KEONJHAR)-KARAMPADA (JHARKHAND)	13	KOTGARH-CHANDRAPUR
7	MAULABHANJ-JIRIDIMAL-ANANTPUR	14	KARLAPAT-URLADANI

Source: Wild Lifeof Orissa, Forest Department, Govt. of Orissa

Source : Page No. 12, Remote Sensing Application for characterization of Elephant Habitats & Corriodors in Orisa & part of the Bihar by PCCF (Wildlife &CWLW,Bhubaneswar and ORSAC,Bhubaneswar



Source: Wild Life of Orissa, Forest Department Govt. of Orissa



Prepared by:-

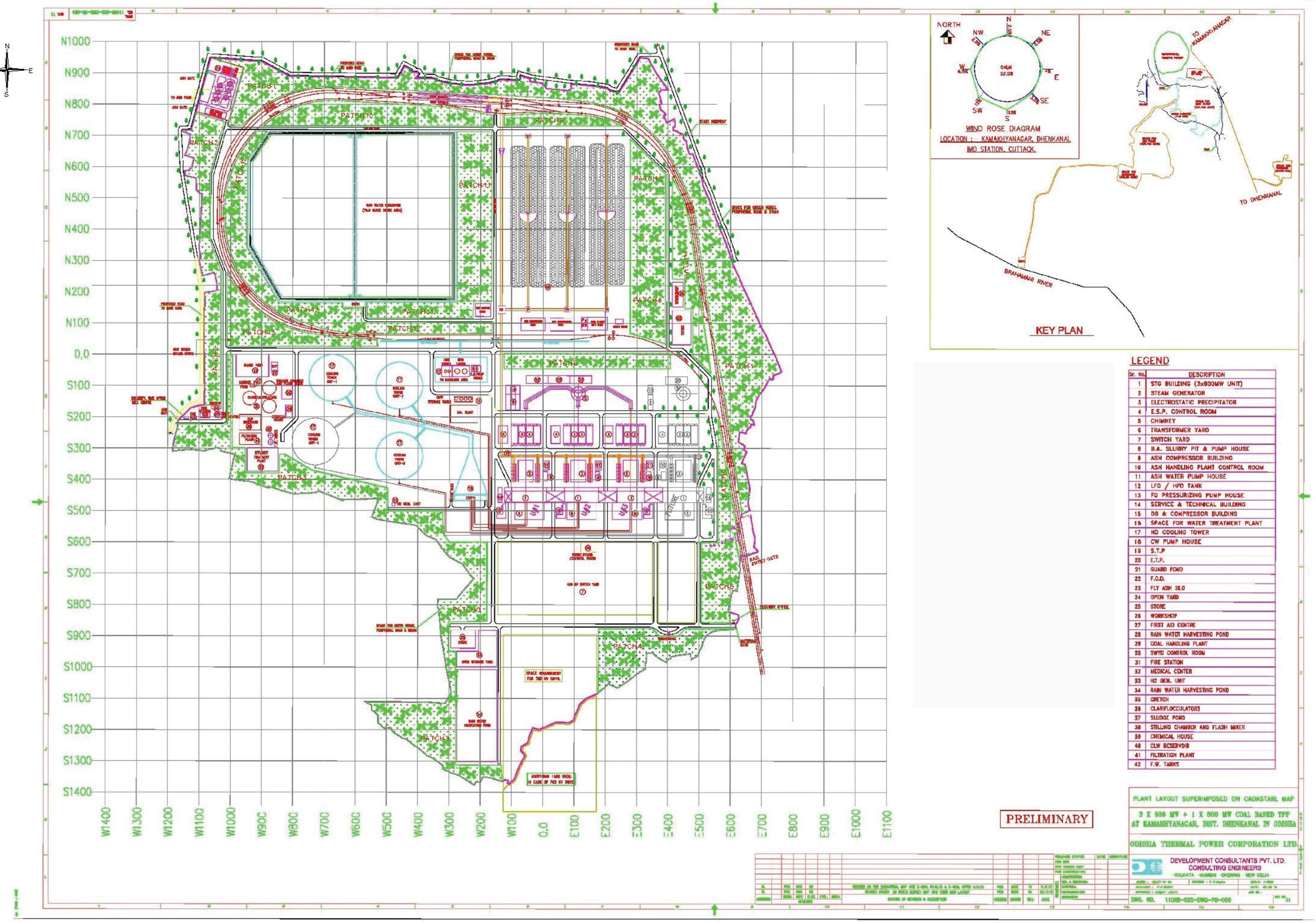
GGCPL Patia, BBSR
On Behalf of
OTPC,LTD

Chief Executive Officer
Odisha Thermal Power Corpn. Ltd.

Forest Range Officer
Kamakhyanagar West Range

Divisional Forest Officer
Dhenkanal Division

Annexure III



LEGEND

Sr. No.	DESCRIPTION
1	STG BUILDING (3x800MW UNIT)
2	STEAM GENERATOR
3	ELECTROSTATIC PRECIPITATOR
4	E.S.P. CONTROL ROOM
5	CHIMNEY
6	TRANSFORMER YARD
7	SWITCH YARD
8	B.A. SLURRY PIT & PUMP HOUSE
9	ASH COMPRESSOR BUILDING
10	ASH HANDLING PLANT CONTROL ROOM
11	ASH WATER PUMP HOUSE
12	LFO / HFO TANK
13	FO PRESSURIZING PUMP HOUSE
14	SERVICE & TECHNICAL BUILDING
15	DG & COMPRESSOR BUILDING
16	SPACE FOR WATER TREATMENT PLANT
17	ND COOLING TOWER
18	CW PUMP HOUSE
19	S.T.P
20	E.T.P.
21	GUARD POND
22	F.O.D.
23	FLY ASH SILO
24	OPEN YARD
25	STORE
26	WORKSHOP
27	FIRST AID CENTRE
28	RAIN WATER HARVESTING POND
29	COAL HANDLING PLANT
30	SWYD CONTROL ROOM
31	FIRE STATION
32	MEDICAL CENTER
33	H2 GEN. UNIT
34	RAIN WATER HARVESTING POND
35	CRETCH
36	CLARIFLOCCULATORS
37	SLUDGE POND
38	STILLING CHAMBER AND FLASH MIXER
39	CHEMICAL HOUSE
40	CLW RESERVOIR
41	FILTRATION PLANT
42	F.W. TANKS

PRELIMINARY

PLANT LAYOUT SUPERIMPOSED ON CADASTARL MAP

3 X 800 MW + 1 X 800 MW COAL BASED TPP
AT KAMAKHYANAGAR, DIST. DHENKANAL IN ODISHA

ODISHA THERMAL POWER CORPORATION LTD.

DEVELOPMENT CONSULTANTS PVT. LTD.
CONSULTING ENGINEERS
-KOLKATA -MUMBAI -CHENNAI - NEW DELHI

DWG. NO. 1100B-000-DWG-PD-008

PROPOSED INTERVENATIONS

SITE OF 9 K.M AVENUE PLANTATION

SITE OF 95.507 HA. 3 TIER GREEN BELT PLANTATION

Prepared by:-

GGCPL Patia, BBSR
On Behalf of
OTPCL

MAP SHOWING PROPOSED GREEN BELT (13 PATCHES)
IN THE PROJECT AREA OF OTPCL POWER PLANT
AT KAMAKHYANAGAR ON SURVEY OF
INDIA TOPOSHEET NO.F45T9
IN DHENKANAL DISTRICT OF ODISHA
SCALE-1:4,000

SCHEME FOR COMPENSATORY AFFORESTATION OVER AN AREA OF 38.458 Ha OF NON-FOREST GOVT. LAND IN VILLAGE KATENI, KANTAKHOL, & JOGIDIHA

AGAINST THE FOREST LAND USED BY- M/s. OTPCL (ODISHA THERMAL POWER CORPORATION LIMITED).

IN LIEU OF DIVERSION OF FOREST LAND OVER AN AREA OF 38.098 Ha FOR CONSTRUCTION OF 3 X 800 MW SUPER CRITICAL THERMAL POWER PLANT UNDER KAMAKHYANAGAR TAHASIL OF DHENKANAL DISTRICT

DHENKANAL FOREST DIVISION

DHENKANAL

SCHEME FOR COMPENSATORY AFFORESTATION IN NON-FOREST GOVT. LAND OVER AN AREA OF 38.458 HA. IN VILLAGE KONATAKHOL, JOGIDIHA AND KATENI OF KAMAKHYANAGAR (WEST) RANGE UNDER KAMAKHYANAGAR TAHASIL OF DHENKANAL FOREST DIVISION IN DHENKANAL DISTRICT IN LIEU OF DIVERSION OF 38.098 HA. OF FOREST LAND FOR CONSTRUCTION OF 3X800 MW SCTPP BY OTPCL

1. INTRODUCTION:

The Ministry of Power, Govt. of India initiated scheme for development of Ultra Mega Power Projects through tariff based competitive bidding and advise all states for development of appropriate new power projects in the respective states. In response to the above initiative and to mitigate present power shortage in the state and to meet the projected power requirement due to rapid industrialization, the Govt. of Odisha decided to form a joint venture company between Odisha Hydro Power Corporation Ltd. (OHPC) & Odisha Mining Corporation Ltd. (OMC) both state Govt. undertakings for establishment of a large Thermal Power Plant.

The non-forest Govt. land over an area of 38.458 Ha. has been sanctioned by Collector, Dhenkanal for raising compensatory Afforestation in village Kantakhol, Jogidiha & Kateni under Kamakhyanagar Tahasil of Dhenkanal District in lieu of diversion of 38.098 ha. of forest land for construction of 3X800 MW Super Critical Thermal Power Plant by M/s Odisha Thermal Power Corporation Ltd.

2. DESCRIPTION OF EXISTING VEGETATION:

The Compensatory Afforestation sites identified are having scrubs and open forest. The selected site is covered with miscellaneous species, weeds like Lantana and Eupatorium. The main species noticed are Sal (Shorearobusta), Asan (Terminaliaalata), Cashew (Anacardium occidentale) etc.

3. TOPOGRAPHY & SOIL:

The Compensatory Afforestation sites are shown in Topo Sheet No. 73H/9 or F-45T9. As the Compensatory Afforestation Sites are located in three different patches, the topography and soil varies from site to site.

i. **Kantakhol:**

The site is having some abandoned illegal morum quarry area. The soil is mostly lateritic. The plantation in this site will be taken up as per the provision made in the cost norm of Bald Hill Plantation @1600 Plants per Hector.

ii. **Jogidihi:**

The site is moderately hill slope and susceptible to erosion. Soil depth is shallow, excessively drained and top soil is gravelly. Basing on the present vegetation ANR with GAP Plantation can be taken up @800 Plants per Hector.

iii. **Kateni:**

The site is having small hillock and good soil depth. Basing on the present vegetation ANR with GAP Plantation can be taken up @800 Plants per Hector.

4. CLIMATIC CONDITION:

The climatic condition of the area favoring growth of dry deciduous forest having average annual rain fall of 110-120 cm. and maximum temperature 45^{0}C. The summer season is from March to June, winter from November and February and rainy season is from July to September.

5. OBJECTIVE OF THE SCHEME:

It is mandatory requirement under the provision of F.C. Act, 1980

(i) To replenish the loss of forest land to be diverted for non-forestry purpose i.e. construction of 3x800MW SCTPP of M/s OTPCL

(ii) To generate employment to the villagers living around the area.

(iii) To increase the ground water table through Soil & Moisture Conservation.

(iv) To increase the bio-diversity for improvement of the local ecology.

(v) To fulfill the requirement of fuel wood & small timber of the local inhabitants.

(vi) To provide a green clothing to the area by means of artificial regeneration or plantation in-order to reduce soil erosion.

6. ECO-RESTORATION OPERATION:

(I) All high stumps shall be cut with sharp axe to facilitate development of coppice shoot.

(ii) Coppice with multiple shoots should be singled out by retaining the sound ones.

(iii) Complete protection against fire, grazing and illicit felling shall be ensured.

(iv) The area should be managed under JFM mode i.e. involving the local VSS members from the inception of this project.

(v) The indigenous hardy species suitable for soil condition (as detailed below) should be preferred for artificial regeneration. Preference should be given to species suitable for elephant forage and having multiple utility.

7. PLANTATION TECHNIQUE:

The area should be properly demarcated before raising plantation by GPS survey and posting of pillars. A map should be prepared and followed for execution of the plantation and soil moisture conservation activities basing on the soil conditions. Preferably indigenous species are to be planted coupled with soil and moisture conservation measures. Bamboo plantation should be raised all along the boundary of plantation site not only to act as live barrier to save the plantation from biotic interference particularly grazing by domestic animal visiting forest areas during growing period from the inception to 10th year of Plantation.

As the C.A. land are situated in 3(three) different patches and small sized area, the approved Cost Norm of PCCF, Odisha may not suffice the requirement under watch and ward along with watering. Taking field situation into consideration, some additional provision for watch and ward and watering are suggested for better protection and survival of the plantation.

Out of three Compensatory Afforestation site, the site at Kantakhol is lateritic, which can be taken under Bald Hill type Plantation Model. The other two sites i.e. Jogidiha and Kateni since having some existing tree growth, but degraded in nature and the top soil has been completely washed out,, therefore provision for foreign fertile soil has been suggested for establishments of sapling in plantation site.

Site wise area taken under different afforestation scheme:

Sl. No.	Name of the Village / Site	Area (in Ha.)	Type of Afforestation Model suggested
1	Kantakhol	12.013	Bald Hill @ 1600 Plants per Ha.
2	Jogidiha	9.570	ANR with Gap Plantation @ 800 Plants per Ha.
3	Kateni	16.875	ANR with Gap Plantation @ 800 Plants per Ha.

The land schedule of non-forest land identified in Village Kantakhol, Jogidiha and Kateni are furnished below:-

Name of Mouza / Village	Khata No.	Plot No.	Kissam	Total area in acs	Area for compensatory Afforestation in Acres/Ha.		No. of Pillars
Kantakhol	69	476	Patharbani	8.00	8.00	3.237	57
	69	481	Patharbani	0.69	0.69	0.278	
	69	487	Patharbani	21.00	21.00	8.498	
				Total		**12.013**	
Jogidiha	148	532	Pahad-II	23.840	23.64	9.570	17
Kateni		03	Parbat-I	42.50	41.70	16.875	17
				Total	**AC. 95.03**	**38.458**	91

SURVEYED DETAILS OF COMPENSATORY AFFORESTATION

GPS COORDINATES OF CA LAND AREA (VILLAGE: KANTAKHOL)					
SL NO	PILLAR NO	EASTING	NORTHING	LATITUDE	LONGITUDE
1	1	354366.328	2305825.511	20°50'48.46776"	85°36'00.88272"
2	2	354317.577	2305811.026	20°50'47.98284"	85°35'59.20080"
3	3	354311.570	2305780.644	20°50'46.99320"	85°35'59.00208"
4	4	354360.676	2305686.672	20°50'43.95120"	85°36'00.72900"
5	5	354380.106	2305669.362	20°50'43.39392"	85°36'01.40652"
6	6	354374.101	2305659.116	20°50'43.05912"	85°36'01.20168"
7	7	354376.926	2305620.963	20°50'41.81892"	85°36'01.31076"
8	8	354376.220	2305615.663	20°50'41.64648"	85°36'01.28808"
9	9	354379.047	2305610.364	20°50'41.47512"	85°36'01.38744"
10	10	354377.633	2305592.346	20°50'40.88868"	85°36'01.34388"
11	11	354390.705	2305547.834	20°50'39.44472"	85°36'01.80972"
12	12	354403.069	2305542.181	20°50'39.26436"	85°36'02.23884"
13	13	354407.662	2305504.380	20°50'38.03640"	85°36'02.40912"
14	14	354378.693	2305469.053	20°50'36.87972"	85°36'01.41768"
15	15	354357.497	2305475.765	20°50'37.09176"	85°36'00.68256"
16	16	354350.784	2305459.515	20°50'36.56148"	85°36'00.45504"
17	17	354332.413	2305439.024	20°50'35.89008"	85°35'59.82576"
18	18	354315.456	2305425.246	20°50'35.43720"	85°35'59.24328"
19	19	354307.684	2305384.973	20°50'34.12536"	85°35'58.98660"
20	20	354285.428	2305368.368	20°50'33.57888"	85°35'58.22160"
21	21	354283.308	2305352.824	20°50'33.07308"	85°35'58.15320"
22	22	354276.949	2305351.411	20°50'33.02520"	85°35'57.93360"
23	23	354261.405	2305309.018	20°50'31.64208"	85°35'57.40872"

24	24	354336.300	2305294.534	20°50'31.19244"	85°36'00.00360"
25	25	354332.061	2305269.098	20°50'30.36408"	85°35'59.86464"
26	26	354306.978	2305267.331	20°50'30.29928"	85°35'58.99776"
27	27	354309.804	2305236.243	20°50'29.28912"	85°35'59.10468"
28	28	354300.265	2305231.296	20°50'29.12568"	85°35'58.77636"
29	29	354248.687	2305099.524	20°50'24.82584"	85°35'57.03180"
30	30	354242.681	2305073.734	20°50'23.98560"	85°35'56.83164"
31	31	354207.000	2305034.521	20°50'22.70040"	85°35'55.60908"
32	32	354190.042	2305036.640	20°50'22.76448"	85°35'55.02192"
33	33	354188.629	2305012.265	20°50'21.97140"	85°35'54.98052"
34	34	354402.363	2305179.365	20°50'27.46572"	85°36'02.32380"
35	35	354461.714	2305223.524	20°50'28.91868"	85°36'04.36356"
36	36	354549.326	2305333.394	20°50'32.51616"	85°36'07.36128"
37	37	354598.786	2305445.737	20°50'36.18348"	85°36'09.03852"
38	38	354609.030	2305472.586	20°50'37.05936"	85°36'09.38484"
39	39	354580.769	2305479.298	20°50'37.26996"	85°36'08.40492"
40	40	354588.187	2305506.501	20°50'38.15664"	85°36'08.65332"
41	41	354569.110	2305517.452	20°50'38.50728"	85°36'07.99020"
42	42	354494.921	2305581.395	20°50'40.56576"	85°36'05.40468"
43	43	354496.335	2305604.712	20°50'41.32428"	85°36'05.44644"
44	44	354460.653	2305628.028	20°50'42.07236"	85°36'04.20516"
45	45	354455.001	2305667.949	20°50'43.36908"	85°36'03.99780"
46	46	354457.828	2305677.840	20°50'43.69164"	85°36'04.09248"
47	47	354443.696	2305701.510	20°50'44.45736"	85°36'03.59640"
48	48	354473.371	2305738.604	20°50'45.67200"	85°36'04.61196"
49	49	354482.910	2305773.578	20°50'46.81176"	85°36'04.93128"
50	50	354487.856	2305772.166	20°50'46.76748"	85°36'05.10300"
51	51	354488.209	2305779.938	20°50'47.02020"	85°36'05.11272"
52	52	354561.809	2305756.372	20°50'46.27464"	85°36'07.66584"
53	53	354567.815	2305730.584	20°50'45.43764"	85°36'07.88148"
54	54	354652.955	2305703.734	20°50'44.58876"	85°36'10.83492"
55	55	354646.596	2305691.369	20°50'44.18484"	85°36'10.61856"
56	56	354682.277	2305672.645	20°50'43.58580"	85°36'11.85840"
57	57	354698.174	2305707.267	20°50'44.71620"	85°36'12.39804"

GPS COORDINATES OF CA LAND AREA (VILLAGE: JOGIDIHA)

SL NO	PILLAR NO	EASTING	NORTHING	LATITUDE	LONGITUDE
1	1	347850.575	2297213.932	20°46'06.54960"	85°32'18.18240"
2	2	347838.808	2297187.034	20°46'05.67120"	85°32'17.78640"
3	3	347846.536	2297183.464	20°46'05.55600"	85°32'18.05280"
4	4	347850.861	2297193.676	20°46'05.89080"	85°32'18.20040"
5	5	347906.429	2297174.920	20°46'05.29680"	85°32'20.12640"
6	6	347900.640	2297158.970	20°46'04.77480"	85°32'19.93200"
7	7	347961.879	2297143.413	20°46'04.28880"	85°32'22.05240"

8	8	347966.083	2297166.130	20°46'05.03040"	85°32'22.19280"
9	9	348040.239	2297148.456	20°46'04.47600"	85°32'24.76320"
10	10	348031.292	2297121.283	20°46'03.59040"	85°32'24.46080"
11	11	348093.431	2297101.217	20°46'02.95680"	85°32'26.61360"
12	12	348106.299	2297145.859	20°46'04.41120"	85°32'27.04560"
13	13	348079.085	2297283.379	20°46'08.87520"	85°32'26.06280"
14	14	348032.042	2297334.563	20°46'10.52400"	85°32'24.42120"
15	15	347895.570	2297404.558	20°46'12.75960"	85°32'19.68000"
16	16	347886.213	2297412.926	20°46'13.02960"	85°32'19.35240"
17	17	347818.379	2297223.351	20°46'06.84480"	85°32'17.06640"

GPS COORDINATES OF CA LAND AREA (VILLAGE : KATENI)

SL NO	PILLAR NO	EASTING	NORTHING	LATITUDE	LONGITUDE
1	1	344497.813	2304587.495	20°50'05.32500"	85°30'19.90152"
2	2	344391.279	2304627.729	20°50'06.60120"	85°30'16.20360"
3	3	344318.177	2304618.095	20°50'06.26604"	85°30'13.67820"
4	4	344205.976	2304610.159	20°50'05.97408"	85°30'09.79992"
5	5	344102.840	2304584.662	20°50'05.11368"	85°30'06.24060"
6	6	344072.808	2304517.227	20°50'02.91192"	85°30'05.22360"
7	7	344046.174	2304499.661	20°50'02.33232"	85°30'04.30776"
8	8	344038.807	2304483.790	20°50'01.81428"	85°30'04.05828"
9	9	343994.606	2304489.457	20°50'01.98492"	85°30'02.52756"
10	10	343965.706	2304368.756	20°49'58.05156"	85°30'01.56672"
11	11	344016.140	2304242.390	20°49'53.95764"	85°30'03.35196"
12	12	344056.940	2304269.024	20°49'54.83604"	85°30'04.75452"
13	13	344099.441	2304256.557	20°49'54.44328"	85°30'06.22872"
14	14	344117.008	2304272.423	20°49'54.96456"	85°30'06.83100"
15	15	344185.008	2304230.490	20°49'53.62176"	85°30'09.19656"
16	16	344184.442	2304271.291	20°49'54.94836"	85°30'09.16380"
17	17	344492.713	2304269.591	20°49'54.98616"	85°30'19.82700"

10. NURSERY:

A) A good nursery is the pre-requisite for a successful plantation. All care should be taken to raise healthy and sound seedlings of required sizes before they are put to plantation site. Planting of one year old seedling of above species shall be taken up. Nursery Programme must be planned out as per the "Guide-lines" in the plantation manual so that a good stock of healthy Seedling can be raised and 10% extra seedling shall be raised to cover the shortfall due to casualty in the nursery stage.

B) The temporary nursery should be raised near the plantation site as far as practicable.

C) Good variety of seeds/stumps should be used.

D) Proper treatment of seeds should be done as per the Plantation manual.

E) Shifting of Potted seedlings is recommended not only to develop resistance for isolation but not to allow the roots striking into the ground soil.

10.1. PROTECTION:

The important element of successful plantation is Protection. Watch and Ward provisions shall be made on daily wage basis for ten years.

10.2. CONTROL:

The Nursery Journal, the Plantation Journal and other records shall be maintained separately in accordance with the provision of "The Orissa Forest Plantation Manual 1977" indicating the physical and financial achievements. Necessary entries with regard to plantation activities undertaken shall be entered in the Journals and shall be produced before the inspecting officers. In case of any eventuality like cyclone, thunderstorm, hail storm etc. if affect the plantation, this should also be noted. It is also necessary to note the distribution of rain fall which not only helps in monitoring the growth of plants at site but also acts as a guideline for the ensuing year's nursery schedule to be formulated.

For protection, measures shall be taken to save the plantation from fire incidence and prevent accidental trespass of cattle, goat etc. to the premises of the nursery & plantation. Boundary area will be scrapped to a width of 2 mtr. During February / March the cut materials are to be burnt under strict supervision. The inspection path around 4.00 Ha plot shall have to be laid out and weed growths are to be scrapped. Fallen leaves etc are to be swept regularly.

11. SOIL & WATER CONSERVATION MEASURES:

It is indispensable to take up the soil & moisture conservation work. Small gullies are to be plugged by live plants. As the area in susceptible to loose moisture contents quickly, soil moisture conservation measures will be taken up by digging staggered trenches. These trenches will be dug along the contour in a continuous manner. The dimensions of the trench will be 2.5 mtr x 0.5 mtr x 0.5 mtr. and dug out earth will be kept on the lower hill side. It should be 300 nos. in an average per hectares. Staggered trenches are to be aligned 15 mtr. apart along the contour and 7.5 mtr. across the contour. In addition to above, leguminous tree seeds are to be sown in the inter space between the plants. Check dams are proposed to be constructed out of dry rubbles across the nallahs & gullies.

12. PEOPLE'S PARTICIPATION:

The local communities are to be involved for the protection of the plantation. The V.S.S. is to be formed (if not done earlier) & incentives to be given to the V.S.S. for their active participation in protecting the plantation. Livelihood option and Entry Point Activities (EPA) are to be taken to improve the socio economic status of the people living around the forest. For effective protection of area watch and ward shall be provided during the project period (from inception to 10th year) and subsequently the plantation will be looked after by the V.S.S.

13. WATCH AND WARD:

Watchers (one watcher for every 10 Ha. of Plantation) should be engaged round the year for 10 years starting from the day of inception of the plantation. Also extra provision for watch and ward has been introduced in the scheme for better protection of plantation.

14. FUNDING AGENCY:

Chief Executive Officer (CEO), OTPCL will pay the cost of Afforestation in one lot for 38.458 ha. Amounting to Rs. **1,72,17,305.00**/- (Rupees One Crore Seventy Two Lakhs Seventeen Thousand Three Hundred Five Only) on receipt of Demand Notice from D.F.O., Dhenkanal Division after receiving due approval from Addl. PCCF (F.D & N.O F.C Act) O/o PCCF Odisha in Adhoc-CAMPA in the savings Bank Account pertaining to the State concerned through the e-payment mode only and Rs.**38,00,000**/-(Rupees Thirty Eight Lakhs only)towards remuneration of driver, cost of fuel and maintenance shall be deposited in favour of Divisional Forest Officer, Dhenkanal Division after issue of specific order from the Addl. PCCF (F.D & N.O F.C Act) O/o PCCF Odisha. However, the Chief Executive will furnish an undertaking to pay any additional amount in case the Wage Rate is escalated between the date of recommendation of this proposal and issue of Stage-II approval issued by MoEF for diversion of forest land.

15. EXECUTING AGENCY:

Divisional Forest Officer, Dhenkanal Forest Division.

16. MONITORING AND EVALUATION:

Divisional Forest Officer, Dhenkanal Forest Division shall monitor and evaluate the scheme periodically.

Cost Norm for Bald hill Plantation @ 1600 plants/Ha for site identified in village Kantakhol over an area of 12.013 Ha. in current wage rate of Rs. 280.00 per manday.

Sl No	Item of work	Preferable period of execution	Manday	Labour cost @ Rs 280/- per day	Material cost per hectare in Rs	Total cost per hectare in Rs.
	Preparatory operation (0th Year)					
1.	Survey and demarcation	June	2	560	0	560
2.	Fencing i. For an average of 126 meters/ha @ Rs. 76.19/- per meter for bamboo twigs and bamboo thorn fencing (L:M=40:60) ii. To be strengthened by planting of bamboo and other seedlings in two rows. Bamboo to be planted at 2 meters spacing in staggered manner on the two rows, and the rest of the species to be planted at ½ meter spacing along the two rows, the rows being 2m apart. Thus 500 plant (125 bamboo and 375 others) to be planted in two rows to cover 126 m of periphery/Ha by the vegetative fence. (Bamboo seedlings @ Rs. 12.43 per seedling X 125 = Rs. 1553.75, Agave seedling @ Rs. 4.90 per seedling X 375 = Rs. 1837.5)	June-Sept June-Sept	19 11	5320 3080	4280 3391.25	9600 6471.25
3.	Pitting (1600 pits per ha.)- each pit 45cm³	Nov-Dec	128	35840	0	35840
4.	Soil and water conservation measures (a) Staggered trench along the contour @ 300 per ha (2.5mx0.5mx0.5m), digging of percolation pits @ 600 per ha in lieu of staggered trenches, gully plugging and Drainage line treatment, half moon trench on the uphill side of each planting pit (100 MD for staggered trench / percolation pits and 30 MD for gully plugging, drainage line treatment and half moon trench)	Sept-Nov	130	36400	0	36400
	(b) Site clearance-8 MD. Alignment and staking of contour lines on ground, planting pits, contour trenches/ percolation pits and check dam sites etc.-2 MD	July-Aug	10	2800	0	2800

5.	Raising of seedlings in poly bags (minimum 60 cm high) @ Rs 12.43 per seedling (Rs 8.67 in 0th year + Rs. 3.76) Part (1760 saplings to be raised for one hectare)	October-March	44	9394	2939	12333
	Sub-Total		**344**	**96320**	**10610**	**106930**
6.	Monitoring & Supervision charge 5% of the total cost					5347
	Grand Total		**344**	**96320**	**10610**	**112277**
	Planting Operation (1st Year)					
1.	Cost of sapling (balance) from April-June/July @ Rs 3.76 per seedling for 1760 seedlings	April-June	21.5	6020	593	6613
2.	Freshening of pits-64 MD, filling with fertile soil and farm yard manure (FYM)-24 MD, application of insecticide and planting of 60 cm tall saplings including carriage of plants-21MD	June-July	109	30520	0	30520
3.	Cost of fertile soil 0.25 cft @ Rs 8 per cft/ FYM 0.25 cft @ Rs 15 per cft per pit		0	0	9200	9200
4.	Sowing of seeds on dug out earth of trench	June	6	1680	200	1880
5.	Carriage-6 MD. Planting including casualty replacement-6 MD, fertilizer application-5 MD, 1st weeding-7 MD, 2nd weeding-5 MD, soil working-7 MD.	July-August	36	10080	0	10080
6.	Cost of fertilizer and insecticide (Granular insecticide @ 5gms/plant @Rs 80/- per kg = Rs 640.00, NPK 100 gms/plant in two doses @ Rs 24 per kg = Rs 3840.00		0	0	4480	4480
7.	Repair and maintenance of bamboo fence including material cost	Aug-Oct	15	4200	2540	6740
8.	Maintenance of Soil and Moisture Conservation measures (20% of cost)	October-December	26	7280	0	7280
9.	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	30	. 8400	0	8400
10	Fire tracing and control, display board construction, painting/writing, other miscellaneous cost	Jan-Feb	10	2800	360	3160
	Sub-Total		**253.5**	**70980**	**17373**	**88353**
	Monitoring & Supervision charge 5% of the total cost					4418
	Grand Total		**253.5**	**70980**	**17373**	**92771**

Maintenance Operation (2nd Year)						
1.	Casualty replacement-6 MD including seedling cost @ Rs 12.43 per seedling and its transportation	June-July	10	2800	1988.80	4788.80
2.	Soil working-7 MD, 1st weeding-6 MD, 2nd weeding-6 MD and fertilizer application-4 MD	August-October	23	6440	0	6440
3.	Cost of fertilizer @ 50 gms NPK per plant @ Rs 24/- per kg for 1600 plants = Rs 1920.00. Insecticide @ 5 gm per plant for 160 nos of plants @ Rs 80 per kg = Rs 64.00		0	0	1984	1984
4.	Repair and maintenance of bamboo fence including material cost	August-October	15	4200	2540	6740
5.	Maintenance of Soil and Moisture Conservation measures (20% of cost)	August-October	26	7280	0	7280
6.	Fire tracing and control, and other miscellaneous cost	Feb-March	10	2800	0	2800
7.	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	30	8400	0	8400
	Sub-Total		**114**	**31920**	**6513**	**38433**
8.	Monitoring & Supervision charge 5% of the total cost					**1922**
	Grand Total		**114**	**31920**	**6513**	**40354**
Maintenance Operation (3rd Year)						
1.	Repair and maintenance of fence-15 MD/(in case of barbed wire fencing Rs. 9000/- for repair), SMC measures (Renovation)-26 MD and Maintenance of Plantation-14 MD as per requirement	April-March	55	15400	500	15900
2	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	5040	0	5040
	Sub-Total		**73**	**20440**	**500**	**20940**
3	Monitoring & Supervision charge 5% of the total cost					1922
	Grand Total		**73**	**20440**	**500**	**21987**
Maintenance Operation (4th Year)						
1	Repair and maintenance of fence-13 MD/ no maintenance in case of barbed wire fencing,SMC measures-21 MD and maintenance of plantation-14 MD	April-March	48	13440	500	13940
2	Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	5040	0	5040
	Sub-Total		**66**	**18480**	**500**	**18980**
3	Monitoring & Supervision charge 5% of the total cost					**949**
	Grand Total		**66**	**18480**	**500**	**19929**

Maintenance Operation (5th Year)					
Repair and maintenance of fence-13 MD/ no maintenance in case of barbed wire fencing,SMC measures-21 MD and maintenance of plantation-14 MD	April-March	48	13440	500	13940
Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	5040	0	5040
Sub-Total		**66**	**18480**	**500**	**18980**
Monitoring & Supervision charge 5% of the total cost					**949**
Grand Total		**66**	**18480**	**500**	**19929**
Maintenance Operation (6th Year)					
Repair and maintenance of fence-13 MD/ no maintenance in case of barbed wire fencing,SMC measures-21 MD and maintenance of plantation-14 MD	April-March	48	13440	500	13940
Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	5040	0	5040
Sub-Total		**66**	**18480**	**500**	**18980**
Monitoring & Supervision charge 5% of the total cost					**949**
Grand Total		**66**	**18480**	**500**	**19929**
Maintenance Operation (7th Year)					
Repair and maintenance of fence-13 MD/ no maintenance in case of barbed wire fencing,SMC measures-21 MD and maintenance of plantation-14 MD	April-March	48	13440	500	13940
Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	5040	0	5040
Sub-Total		**66**	**18480**	**500**	**18980**
Monitoring & Supervision charge 5% of the total cost					949
Grand Total		66	18480	500	19929
Maintenance Operation (8th Year)					
Repair and maintenance of fence-13 MD/ no maintenance in case of barbed wire fencing,SMC measures-21 MD and maintenance of plantation-14 MD	April-March	48	13440	500	13940
Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	5040	0	5040
Sub-Total		**66**	**18480**	**500**	**18980**
Monitoring & Supervision charge 5% of the total cost					**949**
Grand Total		**66**	**18480**	**500**	**19929**

Maintenance Operation (9th Year)					
Repair and maintenance of fence-13 MD/ no maintenance in case of barbed wire fencing,SMC measures-21 MD and maintenance of plantation-14 MD	April-March	48	13440	500	13940
Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	5040	0	5040
Sub-Total		**66**	**18480**	**500**	**18980**
Monitoring & Supervision charge 5% of the total cost					**949**
Grand Total		**66**	**18480**	**500**	**19929**
Maintenance Operation (10th Year)					
Repair and maintenance of fence-13 MD/ no maintenance in case of barbed wire fencing,SMC measures-21 MD and maintenance of plantation-14 MD	April-March	48	13440	500	13940
Closure to grazing, fire and other biotic interference by engaging watch & ward	April-March	18	5040	0	5040
Sub-Total		**66**	**18480**	**500**	**18980**
Monitoring & Supervision charge 5% of the total cost					**949**
Grand Total		**66**	**18480**	**500**	**19929**

ABSTRACT

Year	Mandays	Labour cost (Rs.)	Material cost (Rs.)	Monitoring & Supervision charge 5% of the total cost	Total (Rs.)
0th year	344	96320	10610	5347	112277
1st year	253.5	70980	17373	4417.65	92771
2nd year	114	31920	6513	1922	40354
3rd year	73	20440	500	1047	21987
4th year	66	18480	500	949	19929
5th year	66	18480	500	949	19929
6th year	66	18480	500	949	19929
7th year	66	18480	500	949	19929
8th year	66	18480	500	949	19929
9th year	66	18480	500	949	19929
10th year	66	18480	500	949	19929
Total	1246.5	349020	38496	19307.05	406892

Cost of Bald hill Plantation in village Kantakhol over an area of 12.013 Ha.

Sl. No.	Description	Amount In Rs.
1.	Cost of Block Plantation over 12.013 Ha. @ Rs.4,06,892 x 12.013	48,87,993.59 or 48,87,994.00
2.	EPA(Entry Point Activity) 15 % of plantation cost.	7,33,199.00
3.	Watering provision for 1st and 2nd Year from November to March @ Rs.84.00/- per seedling (1600 × 84 ×2)	2,68,800.00
	Total	**58,89,993.00**

(Rupees Fifty Eight Lakhs Eighty Nine Thousand Nine Hundred Ninety Three Only)

COST NORM FOR ANR PLANATION @ 800 PLANTS PER HECTARE FOR SITE IDENTIFIED IN VILLAGE JOGIDIHA OVER AN AREA OF 9.570 HA. WAGE RATE @280/DAY						
Sl.No.	**Item of Work**	**Preferable period of Execution**	**Labour in Mandays**	**Labour Cost (Rs)**	**Material Cost (Rs)**	**Total Cost in (Rs)**
		0th Year				
1	Survey, Demarcation and Pillar Posting, GPS Reading with mapping	Nov/Dec	2	560	0	560
2	Site Preparation	Nov/Dec	2	560	0	560
3	Silvicultural Operation including clearance of weed, climber cutting, high stump cutting, singling of shoots etc	Jan/Feb	5	1400	0	1400
4	Nursery cost (6 months old seedling) part @ Rs 12.43/- seedling (Rs. 8.67 in 0th year + Rs. 3.76 in 1st year) for 880 seedling (800 + 80)	Jan-Mar	22	6160	1470	7630
5	Contingency and Unforeseen Expenditures		0	0	230	230
	Sub Total		**31**	**8680**	**1700**	**10380**
6	Monitoring & Supervision charge 5% of the total cost					**519**
	GRAND TOTAL		**31**	**8680**	**1700**	**10899**
1st Year						
1	Nursery cost (6 months old seedling) balance @ Rs. 3.76 for 880 seedlings.	Apr-Jul	11	3080	230	3310
2	Pitting 30 cm cube size	Feb/Mar	24	6720	0	6720
3	Carriage and planting including casualty replacement	Jul/Aug	20	5600	0	5600
4	Complete weeding, Soil working, manuring	Aug/Sep	24	6720		6720
5	Cost of Vermi compost 200 gms/plant @ Rs 20/- per kg = Rs 3200.00 and Granular Insecticide 5 gms/ plant @ Rs 80/- per kg = Rs 320.00	Aug/Sep	0	0	3520	3520
6	Cost of Chemical Fertiliser a. Urea 70 gms/plant in two subsequent doses @ Rs 6/- per kg = Rs 336.00 b. NPK 50 gms/ plant @ Rs 24/- per kg = Rs 960.00 as basal dose	Jul/Aug	0	0	1296	1296
7	Fire line tracing and inspection path	Feb/Mar	3	840	0	840
8	Silvicultural Operation involving clearance of weeds, cutting of climbers, singling of shoot etc.	Sep/Oct	15	4200	0	4200
9	Soil conservation measures (staggered trenches of dimension 2m X 0.5m X0.5m @ 60 nos per ha) or its equivalent	Sep/Oct	20	5600	0	5600
10	Watch & Ward	Aug-Mar	7	1960	0	1960
11	Contingency and unforeseen expenditure		0	0	338	338
	Sub Total		**124**	**34720**	**5384**	**40104**
12	Monitoring & Supervision charge 5% of the total cost					**2005**
	GRAND TOTAL		**124**	**34720**	**5384**	**42109**

		2nd Year				
1	Casualty Replacement including cost of seedling, carriage and planting.	Jul/Aug	4	1120	994.40	2114
2	Complete weeding and cultural operations	Sept/Oct	8	2240	0	2240
3	Soil working and manuring	Sept/Oct	8	2240	0	2240
4	Cost of fertilizers and Insecticide a. Vermicompost 200gms/ plant @ Rs 20/- per kg = Rs. 3200.00 b. Granular Insecticides 5 gms/ Plant for 80 plants 400 gms @ Rs 80/- per kg = Rs.32.00	Sept/Oct	0	0	3232	3232
5	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
6	Soil conservation measures (Renovation of staggered trenches etc)	Sep/Oct	8	2240	0	2240
7	Watch & Ward (Whole Year)	Apr-March	7	1960	0	1960
8	Contingency and unforeseen expenditure		0	0	224	224
	Sub Total		**36**	**10080**	**4450**	**14530**
9	Monitoring & Supervision charge 5% of the total cost					727
	GRAND TOTAL		**36**	**10080**	**4450**	**15257**
		3rd Year				
1	Compete weeding and cultural operations	Aug/Sep	4	1120	0	1120
2	Soil working	Aug/Sep	4	1120	0	1120
3	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
4	Watch & Ward (Whole Year)	April-March	7	1960	0	1960
	Sub Total		**16**	**4480**	**0**	**4480**
5	Monitoring & Supervision charge 5% of the total cost					224
	GRAND TOTAL		16	4480	0	4704
		4th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		3	840	0	840
3	Monitoring & Supervision charge 5% of the total cost .					42
	GRAND TOTAL		3	840	0	882
		5th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		3	840	0	840
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		3	840	0	882

		6th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	840
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		**3**	**840**	**0**	882
		7th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	840
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		**3**	**840**	**0**	882
		8th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	840
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		**3**	**840**	**0**	882
		9th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	840
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		3	840	0	882
		10th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	840
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		**3**	**840**	**0**	882

Abstract

Year	Person Days	Labour cost @ Rs 280/per day	Material Cost (Rs.)	Monitoring & Supervision charge 5% of the total cost	Total Cost in (Rs)
0th Year	31	8680	1700	519	10899
1st Year	124	34720	5384	2005	42109
2nd Year	36	10080	4450	727	15257
3rd Year	16	4480	0	224	4704
4th Year	3	840	0	42	882
5th Year	3	840	0	42	882
6th Year	3	840	0	42	882
7th Year	3	840	0	42	882
8th Year	3	840	0	42	882
9th Year	3	840	0	42	882
10th Year	3	840	0	42	882
TOTAL	228	63840	11534	3769	79143

Cost of ANR with GAP Plantation of village Jogidihi over an area of 9.570 Ha.

Sl. No.	Description	Amount in Rs.
1.	Cost of ARR plantation @ 800 plant per Ha. Over 9.570 Ha.	7,57,399.00
2.	EPA (Entry Point Activity) @ 15% on plantation cost	1,13,610.00
3.	Provision for extra manday required for watch & ward in the plantation site over an area of 9.570 Ha. i.e. 20 mandays per Ha. @ Rs. 280	53,592.00
4.	Cost of foreign fertile soil including filling up pits @ 2 cu, ft. including transportation and labour @ Rs. 15 per cu. Ft. i.e. Rs. 30 per pit (pit size 45 cm. x 45 cm. x 45 cm.) for 800 nos. of pit over 9.570 Ha.	2,29,680.00
	Total	11,54,281.00

(Rupees Eleven Lakhs Fifty Four Thousand Two Hundred Eighty One Only)

COSTNORMS FOR AIDED NATURAL REGENERATION (ANR) @ 800 PLANTS PER HACTARE IN VILLAGE KATANI OVER AN AREA OF 16.875 HA. WAGE RATE @280/DAY						
Sl No.	Items of work	Preferable period of Execution	Person Days	Labour cost@ Rs.280 .00/-per day	Material Cost (Rs)	Total cost(Rs)
0th year						
1	Survey, Demarcation and Pillar Posting, GPS Reading with mapping	Nov/Dec	2	560	0	560
2	Site Preparation	Nov/Dec	2	560	0	560
3	Silvicultural Operation including clearance of weed, climber cutting, high stump cutting, singling of shoots etc	Jan/Feb	5	1400	0	1400
4	Nursery cost (6 months old seedling) part @ Rs 12.43/- seedling (Rs. 8.67 in 0th year + Rs. 3.76 in 1st year) for 880 seedling (800 + 80)	Jan-Mar	22	6160	1470	7630
5	Contingency and Unforeseen Expenditures		0	0	230	230
	Sub Total		**31**	**8680**	**1700**	**10380**
6	Monitoring & Supervision charge 5% of the total cost					**519**
	GRAND TOTAL		**31**	**8680**	**1700**	**10899**
1st Year						
1	Nursery cost (6 months old seedling) balance @ Rs. 3.76 for 880 seedlings.	Apr-Jul	11	3080	230	3310
2	Pitting 30 cm cube size	Feb/Mar	24	6720	0	6720
3	Carriage and planting including casualty replacement	Jul/Aug	20	5600	0	5600
4	Complete weeding, Soil working, manuring	Aug/Sep	24	6720		6720
5	Cost of Vermi compost 200 gms/plant @ Rs 20/- per kg = Rs 3200.00 and Granular Insecticide 5 gms/ plant @ Rs 80/- per kg = Rs 320.00	Aug/Sep	0	0	3520	3520
6	Cost of Chemical Fertiliser c. Urea 70 gms/plant in two subsequent doses @ Rs 6/- per kg = Rs 336.00 d. NPK 50 gms/ plant @ Rs 24/- per kg = Rs 960.00 as basal dose	Jul/Aug	0	0	1296	1296
7	Fire line tracing and inspection path	Feb/Mar	3	840	0	840
8	Silvicultural Operation involving clearance of weeds, cutting of climbers, singling of shoot etc.	Sep/Oct	15	4200	0	4200
9	Soil conservation measures (staggered trenches of dimension 2m X 0.5m X0.5m @ 60 nos per ha) or its equivalent	Sep/Oct	20	5600	0	5600
10	Watch & Ward	Aug-Mar	7	1960	0	1960
11	Contingency and unforeseen expenditure		0	0	338	338
	Sub Total		**124**	**34720**	**5384**	**40104**
12	Monitoring & Supervision charge 5% of the total cost					**2005**
	GRAND TOTAL		**124**	**34720**	**5384**	**42109**

2nd Year						
1	Casualty Replacement including cost of seedling, carriage and planting.	Jul/Aug	4	1120	994.40	2114
2	Complete weeding and cultural operations	Sept/Oct	8	2240	0	2240
3	Soil working and manuring	Sept/Oct	8	2240	0	2240
4	Cost of fertilizers and Insecticide c. Vermicompost 200gms/ plant @ Rs 20/- per kg = Rs. 3200.00 d. Granular Insecticides 5 gms/ Plant for 80 plants 400 gms @ Rs 80/- per kg = Rs.32.00	Sept/Oct	0	0	3232	3232
5	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
6	Soil conservation measures (Renovation of staggered trenches etc)	Sep/Oct	8	2240	0	2240
7	Watch & Ward (Whole Year)	Apr-March	7	1960	0	1960
8	Contingency and unforeseen expenditure		0	0	224	224
	Sub Total		**36**	**10080**	**4450**	**14530**
9	Monitoring & Supervision charge 5% of the total cost					727
	GRAND TOTAL		**36**	**10080**	**4450**	**15257**
3rd Year						
1	Compete weeding and cultural operations	Aug/Sep	4	1120	0	1120
2	Soil working	Aug/Sep	4	1120	0	1120
3	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
4	Watch & Ward (Whole Year)	April-March	7	1960	0	1960
	Sub Total		**16**	**4480**	**0**	**4480**
5	Monitoring & Supervision charge 5% of the total cost					224
	GRAND TOTAL		**16**	**4480**	**0**	4704
4th Year						
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		3	840	0	840
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		3	840	0	882
5th Year						
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	840
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		3	840	0	882

		6th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	**840**
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		**3**	**840**	**0**	**882**
		7th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	**840**
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		**3**	**840**	**0**	**882**
		8th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	**840**
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		**3**	**840**	**0**	**882**
		9th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	**840**
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		3	840	0	882
		10th Year				
1	Fire line tracing and inspection path	Feb/Mar	1	280	0	280
2	Watch, Ward & cultural operations	Apr-Mar	2	560	0	560
	Sub Total		**3**	**840**	**0**	**840**
3	Monitoring & Supervision charge 5% of the total cost					42
	GRAND TOTAL		**3**	**840**	**0**	**882**

Abstract

Year	Person Days	Labour cost @ Rs 280/per day	Material Cost (Rs.)	Monitoring & Supervision charge 5% of the total cost	Total Cost in (Rs)
0th Year	31	8680	1700	519	10899
1st Year	124	34720	5384	2005	42109
2nd Year	36	10080	4450	727	15257
3rd Year	16	4480	0	224	4704
4th Year	3	840	0	42	882
5th Year	3	840	0	42	882
6th Year	3	840	0	42	882
7th Year	3	840	0	42	882
8th Year	3	840	0	42	882
9th Year	3	840	0	42	882
10th Year	3	840	0	42	882
TOTAL	228	63840	11534	3769	79143

Cost of ANR with GAP Plantation in village Kateni over an area of 16.875 Ha.

Sl. No.	Description	Amount (in Rs.)
1.	Cost of ARR plantation @Rs. 79143 per Ha. for 16.875 Ha.	13,35,538.00
2.	EPA (Entry Point Activity) @ 15% on plantation cost	2,00,331.00
3.	Provision for extra manday required for watch & ward in the plantation site over an area of 16.875 Ha. i.e. 35 mandays per Ha. i.e. @ Rs. 280	1,69,062.00
4.	Cost of foreign fertile soil including filling up pits @ 2 cu, ft. including transportation and labour @ Rs. 15 per cu. Ft. i.e. Rs. 30 per pit (pit size 45 cm. x 45 cm. x 45 cm.) for 800 nos. of pit over 16.875 Ha.	4,05,000.00
	Total	**21,09,931.00**

(Rupees Twenty One Lakhs Nine Thousand Nene Hundred Thirty One) only

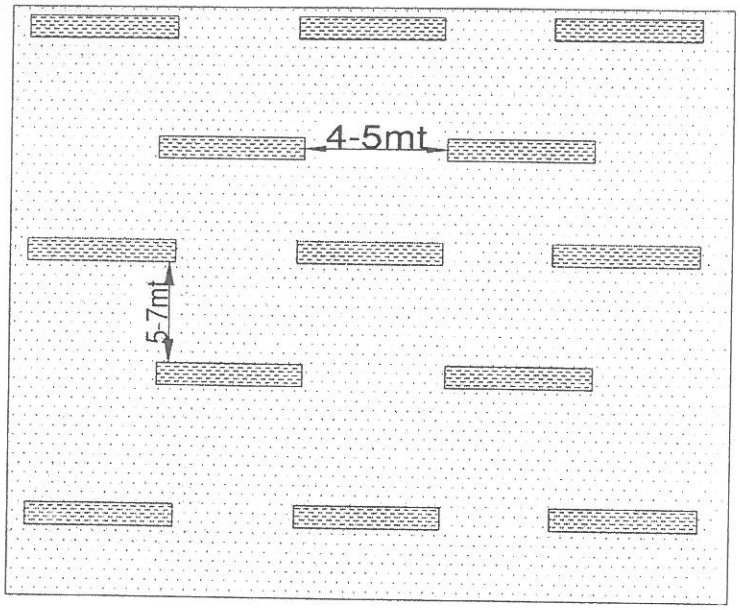
SCHEME FOR SITE SPECIFIC SOIL MOISTURE CONSERVATION ACTIVITIES TO BE UNDERTAKEN IN COMPENSATORY AFFORESTATION AREA OVER 38.458 HA OF NON-FOREST GOVERNMENT REVENUE LAND IDENTIFIED IN VILLAGE KATENI & JOGIDIHA OF KAMAKHYANAGAR TAHASIL, DISTRICT-DHENKANAL.

The **non-forest land identified in Kateni, Jogidiha villages** are having scrubs and open forest with crown density less than 0.1. The selected site is covered with miscellaneous species, weeds like Lantana and Eupatorium. The main species noticed are Sal (*Shorea robusta*), Asan (*Terminalia alata*), and Cashew (*Anacardium occidentale*) etc.

Soil and moisture conservation activities are essentially required to be dove-tailed to plantation activities in order to improve water availability in the proposed site. In order to achieve the objective and implement the program efficiently a well planned strategy is essential. The natural slope of the forest land selected for compensatory afforestation varies from 0^0 to 30^0 being the foothill. The area selected is the catchment where the precipitation touches the ground and subsequently drained through the drainage line. So this becomes the focus area of the soil moisture conservation program. The intervention suggested below is aimed at capturing the rain water to enhance the retention period and to increase the quantum of infiltration.

Forest floor treatment:

- **Staggered Trenches-** the staggered trenches are primarily aim to break the runoff which otherwise will form reels and gullies. Such reels when conversed will form gullies. Continuous gullies when joined together will form a ditch. Therefore it is aimed at excavating 300 Nos. of staggered trenches per Ha. Each such trench will be 2.0 m (length) X 0.5 m (width) x 0.5m (depth). These trenches will conserve rain water of this region and facilitates its percolation. Therefore while aligning such trenches adequate care should be taken so that gullies are not formed by the water flowing downhill from the wedges of trench.



Picturesque diagram of staggered trenches

Staggered Contour Trench(2.5 mt x 0.5 mt x 0.5 mt)

Specifications:

Length - 2.5 mt

Width -0.5 mt

Depth -0.5 mt

Cross Section -(0.5 mt x 0.5 mt)=0.25 sq mt

Earth Work -(2.5 mt x 0.25 sq mt)=0.625 cum

	0-30^0 slope
Gap between Trenches (Horizontal)	4-5 mt
Distance between contour lines (Vertical)	5-7 mt
Cost of Staggered Trench per Ha	Rs 16,800 for300 nos of ST

- Cost of staggered trench per Ha. 60 man days @ Rs. 280/- (Rs.16800 X 26.445 Ha = **Rs.4,45,276.00 /-)**

LOOSE BOULDER CHECK DAM

The structure is to be created across the drainage line for retention of runoff and reduction of velocity. Such structure should preferably have top width of one meter with upstream slope of 1:1 and downstream slope of 1:5. The dimensions of each structure are dependent on several factors such as gradient, catchment size etc.. Hence prescription of a foxed dimension LBCD is not contemplated. Science the cost norm for such structure are based on volume , implementing division will have desire flexibility to design such structure with appropriate dimension.

A. Size – 10' x 10' x5'

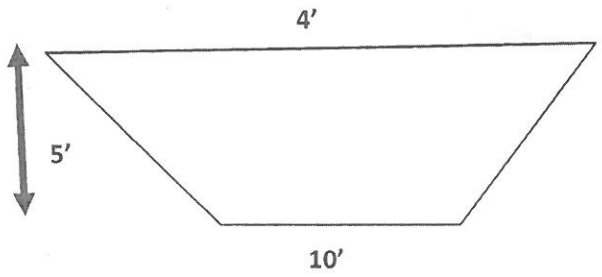
I. Requirement of boulder (procured from quarry)
½ (10' + 4') x 10' x5' =350 cft or 9.90 cum
Cost of boulder @ Rs. 199/-per cum for 9.9 cum – Rs.1,970.00/-

II. Labour for construction of LBCD for 1 cum

Mulia	1.40 No. x 280.00 = 291.20	
Mason special	0.17No. x 370.00 = 62.90	
Stone packer	0.35 No. x 320.00=112.00	
Total		**466.10**
For 9.90 cum	**9.90 x 466.10**	**= 4,614.39**

		6,584.39
		(Rounded to Rs. 6,585/-)

Rate for 1 cum Rs. 665.15 per cum or Rs. 665/- per cum



Cost of LBCD For Jogidiha and Kateni site over an area of 26.445 Ha. per Ha. 200 Nos.i.e 26.44 ha x 200 x 665.00 x 9.9 cum = 34,82,013.00/-

COST OF SMC ACTIVITIES

Sl No.	SMC Measure	Cost (in Rs)
1	Staggered Trenches(2.5mt x 0.5 mt x 0.5mt)	**4,45,276.00**
2	LBCD (Loose Boulder Chek Dam) size 10' x 10' x 5'	**34,82,013.00**
	Total	**39,27,289.00**

(Rupees Thirty Nine lakhs twenty seven thousand two hundred eight nine only)

ESTIMATE FOR BARBED WIRE FENCING

01). 02 ply barbed wire (5 Rmt per kg)
7 Straight Strand X 1000 Mt_____ =7000
Mt 2 Diagonal Strand = 2X $\sqrt{(6.5')^2 + (8.2')^2}$ = 2X10.50 ft
= 21.00 ftX400 nos=8400ft or =2560 Mt
=9560 Mt

Requirement of Barbed wire per Km
Cost per KM=9560/5=1912 kg @Rs.80/kg Rs. 1,52,960.00

02). Construction of RCC pillars of size-
Length-8ft, bottom width 6"X6", Top width -4"X4" Reinforced with 6mm rods with proper curing
{8'X 6"+4"/2} X 6"+4/2 =1.34 cft or 0.038 cum

i) Cost of C.C Work 1:2:3=0.038 cum @5262.57/cum =199.98
ii) Cost of rod including cutting, bending & binding 0.038X0.9 qtl =0.0342 qtl@ Rs. 10, 595, 80/qtl. =362.38
iii) Contingency (15%) including Curing, Stacking, provision of hooks etc. =81.05

Rs. 643.41 or Rs. 644/-

Requirement of Pillars per KM-
Spacing =2.5 mt X2.5 mt =400
Requirement =1000 mt/2.5 mt =80
Strut pillar in every 10th pillar= (400/10)X2

---

480 Nos.

Cost of Pillars per Kilometer = 480@644/- Rs.3,09,120.00/-

03). Fitting fixing of RCC pillars in position with hbg metal (4cm) in C.M (1:4:8)
i) Digging of pits 1.5'X1.5'X1.5'=3.375 cft/pit
for 480 pits, 480X3, 375=1620 cft or 45.86 cum@ Rs. 12,040/100 cum =5521.54
ii) Fixing of pillars with 4 cm hbg metals in C.M 1:4:8
Pit Size - 1.5'X1.5'X1.5' =3.375
cft/pit Deduct 1/3rd of butt of pillar i.e 3.375/3
= (-) 1.125 cft
Total C.C work per pillar ----------
2.25 cft

For 480 pillars = 480 x 2.25= 1080 cft or 30.577 cum @Rs. **3629.46**/cum Rs. 1, 10,978.00

04) Labour of straightening the barbed wire and fixing & clipping with pillers 70 M.d per Km @ 280/- = Rs. 19,600.00

05) Carriage of Barbed wire & piller to worksite @ Rs. 1000/- tl. And cost of loading and uploading within 5 km distance Approximately 10 tld @800/tld = Rs. 18,000.00

06) Provision of one Iron Gate of Size (4' x 5') on LS = Rs. 7,500.00 Total = Rs. 6, 23,680.00

Labour cess1 % = Rs. 6,237.003

Expenditure per km of Barbed wire fencing Rs. 6,29,917.00 Or say, Rs. 629.91/- or Rs. 630/- per meter

07) Expenditure towards maintenance for 3 year (3rd, 6th & 9th) @ 2% of cost per km = 3 x2% x Rs. 6, 29,917/- = Rs. 37,795.00

Expenditure per 1 km of barbed wire fencing including Maintenance = Rs. 6,67,712.00

So expenditure per running meter for fencing = 667.71 meter or say Rs. 668/- meter (Rupees six hundred sixty eight) only/-

Total expenditure for 1600m. Proposed for Kantakhol site =668 .00 X 1600= 10,68,800.00/-
(Rupees ten lakhs sixty eight thousand eight hundred only)

COST NORM FOR VEGETATIVE FENCING (LIVE HEDGE)

Sl .No.	Item of work	Period of execution	Person day	Labour cost (Rs.)	Material cost(Rs.)	Total Cost (Rs.)
1.	For an average of 126 meter/ha. Rs. 76.19per meter for bamboo twigs and bamboo thorn fencing (L:M=40:60)	Jun/Sept	19	5320	4279.94	9599.94
2.	To be strengthening by planting bamboo and other seedling in two rows. Bamboo to be planted at 2 meters spacing in staggered manner on the two rows and the rest of the species to be planted at ½ meter spacing along the two rows to, the rows being 2 m apart. Thus 500 plant (125 bamboo and 375 other) to be planted in two rows to cover 126m of periphery/ha. by the vegetative fencing (Bamboo seedling @ Rs. 12.43 per seedling x 125=Rs. 1553.75, Agave seedling @ Rs. 4.90 per seedling x 375= Rs. 1837.5)	Jun/Sept	11	3080	3391.25	6471.25
		Total	**30**	**8400**	**7671**	**16071**

Vegetative fencing cost per meter = Rs. 16071.19/126m = Rs. 127.55 or 128.00

This provision has been suggested for Jogidiha and Kateni site and the total cost are as follow-

Sl.No.	Site Name	Fencing provision in meter	Cost per meter Rs.	Total cost (Rs.)
1	Jogidiha	1056	128	1,35,168.00
2	Kateni	642.4	128	82,227.00
			Total	**2,17,395.00**

(Rupees two lakhs seventy thousand three hundred ninety five only)

FENCING PROVISION MADE IN COMPENSATORY AFFORESTATION SITES WITH FINANCIAL OUTLAY SELECTED IN DIFFERENT VILLAGES.

Sl. No.	Name of the villages	Fencing provision made in meter	Cost per meter Rs.	Total Rs.
1	Kantakhol(barbed wire)	1600	668	**10,68,800.00**
2	Kateni(Live Hedge)	642.4	128	1,35,168.00
3	Jogidiha(Live Hedge)	1056	128	82,227.00
	Total			**12,86,195.00**
	Rupees twelve lakhs eighty six thousand one hundred ninety five only			

FINANCIAL OUTLAY OF THE SCHEME		
SL NO	**DESCRIPTION**	**AMOUNT (RS.)**
1.	Cost of Bald hill Plantation over an area of 12.013 Ha.	58,70,058.00
2.	Cost of ANR with GAP Plantation over an area of 9.570 Ha.	11,54,281.00
3.	Cost of ANR with GAP Plantation over an area of 16.875 Ha	21,09,931.00
4.	Cost of SMC Activities	**39,27,289.00**
5.	Cost of barbed wire fencing and live hedge fencing	**12,86,195.00**
	Sub Total	**1,43,47,754.00**
	Escalation (20%)	**28,69,550.80**
	Total	**1,72,17,304.80 or 1,72,17,305.00**
5.	Cost of Infrastructure i. One tractor with water tank =1020000.00 ii. Two nos. of 2 HP diesel moter pump = 1,00,000.00 iii. Remuneration of Driver = 15,000 x 12 x 10 = 18,00,000.00 iv. Fuel & maintenance = 20,000 x 12 x 10 = 20,00,000.00	11,20,000.00 38,00,000.00
	Grand Total	**2,21,37,305.00**
Rupees Two Crore Twenty One Lakhs Thirty Seven Three Hundred Five Only		

N.B.

1. The amount of Rs. **1,72,17,305/-** Shall be payable by Odisha Thermal power Corporation Ltd (OTPCL) as per the demand notice to be issued by DFO Dhenkanal Forest Division and after receiving due approval from Addl. PCCF (F.D & N.O F.C Act) O/o PCCF Odisha in Adhoc – CAMPA in the saving Bank Account Pertaining to the state concerned through the e-payment mode only.
2. the use agency (OTPCL) will procure the infrastructure items as mentioned in them no. 5 (i) (ii) and supply to Dhenkanal Forest division and Rs. **38,00,000.00/-** towards remuneration of driver , cost of fuel and maintenance shall be deposited in favour of Dhenkanal Forest Officer , Dhenkanal Division after issue of specific order from the Addl. PCCF (F.D. & N.O F.C Act) O/o PCCF Odisha.

Divisional Forest Officer,
Dhenkanal Forest Division
Divisional Forest Officer
Dhenkanal Division

OFFICE OF THE PRINCIPAL CHIEF CONSERVATOR OF FORESTS, ODISHA, BHUBANESWAR

Letter No. 3849 /9F (Misc)-303/2019
Dated, Bhubaneswar, the 1st ~~February~~ March, 2019

To

The Additional Chief Secretary to Government,
Forest & Environment Department,
Odisha, Bhubaneswar.

Sub: Proposal for diversion of 38.098 ha Revenue Forest land for construction of 3X800 MW Thermal Power Plant under Kamakhyanagar Tahasil of Dhenkanal District by OTPCL.

Sir,

A proposal for diversion of 38.098 ha Revenue Forest land for construction of 3X800 MW Thermal Power Plant under Kamakhyanagar Tahasil of Dhenkanal District by OTPCL has been duly processed and recommended by Divisional Forest Officer, Dhenkanal Forest Division, and Addl. PCCF, Angul Circle is sent herewith in triplicate for consideration of the Government and onward transmission to Government of India, Ministry of Environment Forest & Climate Change for approval under Section-2 of Forest (Conservation) Act, 1980.

Received 2.3.2019

1. Brief Description:

The Ministry of Power, Government of India initiated scheme for development of Ultra Mega Power Projects through tariff based competitive bidding and advise all states for development of appropriate new power projects in the respective states. In response to the above initiative and to mitigate present power shortage in the state and to meet the projected power requirement due to rapid industrialisation, the Government of Odisha decided to form a joint venture company between Odisha Hydro Power Corporation Ltd. (OHPC) & Odisha Mining Corporation Ltd. (OMC) both State Government undertaking for establishment of a large Thermal Power Plant.

In pursuance to the above decision, a joint venture company called "Odisha Thermal Power Corporation Ltd. (OTPCL)" was established in the State of Odisha. The formation of OTPC has been, as per the State Cabinets decision to set up a 2400 MW Coal based Thermal Power Plant in the State of Odisha, the copy of the cabinet decision is enclosed as **Annexure-XII** at **Page No.353-355/DP.** Accordingly, the shareholder agreement between OHPC and OMC was signed with the approval of the State Government and the terms of Agreement was incorporated in the Article of Association. The copy of the MoA & AoA is enclosed as **Annexure-XIII** at **Page No.356-378/DP.**

In pursuant to the decision taken by a Committee of Secretaries of Government of Odisha chaired by Chief Secretary of Odisha, it was decided to implement a 3 X 800 MW = 2400 MW supercritical thermal power plant under Kamakhyaanagar Tahasil of Dhenkanal District with provision for additional one more unit of 1 X 800 MW= 800 MW in future. The copy of Minutes of the Meeting (MOM) is enclosed as **Annexure-XIV** at **Page No.379-380/-DP.** The said project was approved by Central Electricity Authority (CEA), Government of India vide Letter No. 1130 dated 27.07.2016 copy enclosed as **Annexure- XV** at **Page No.381/DP.**

In accordance to the above decision, the project authorities i.e. OTPC surveyed various sites in the District of Dhenkanal and finally selected of (Seven) villages under Kamakhyanagar Tahasil (i.e. AnnapurnapurKhamar (Kha), Aluajharan, Analbareni, Dhobabahali, Kusumajodi, Kateni and Kantapal) as the most suitable site for establishment of 2400 MW (3 x 800 MW) Super Critical Thermal Power Plant.

The Project Report for the railway corridor from Sadashibapur to Project site has been submitted to East Coast Railway through M/s RITES, Consultant engaged by OTPC for survey, approval of Project Report & subsequent project management. Soon after the receipt of the approval from East Coast Railway final survey will be made by RITES & diversion for forest land if any in the Railway Corridor will be done as a linear stand alone project.

The land required for this project execution is 1435.357 Acres or 580.881 ha. comprising of 520.982 Acres or 210.839 ha Government land, 820.235 Acres or 331.945 ha of Pvt. Land and 94.140 Acs. Or 38.098 ha of forest land. The authenticated land schedule is being enclosed as **Annexure-VIII** at **Page No.33/DP**.

The project site is located adjacent to the State Highway connecting Dhenkanal town and Kamakhyanagar. The nearest National Highway (NH-42) connecting Sambalpur and Cuttack through Dhenkanal is at a crow fly distance of about 15 KM south of this site. The neighbouring villages are Aluajharan, Kusumajodi, AnnapurnapurKhamar will be at a distance of 11 Km. The nearest airport is Bhubaneswar Airport, which is about 90 Km away from the project site. M/s OTPC Ltd. is a joint venture of two State PSUs viz:- Odisha Hydro Power Corporation Ltd. (OPHC) and Odisha Mining Corporation Ltd. (OMC).

Co-ordinates of the proposed plant and ash dyke are as in the table below:

Point	Latutude	Longitude
	Main Plant Area	
1	20^0 50'45.6"N	85^0 30'40.6" E
2	20^0 50'40.6"N	85^0 31'29.0"E
3	20^0 50'14.3"N	85^0 31'43.9E
4	20^0 49'47.8"N	85^0 31'38.0"E
5	20^0 49'30.6" N	85^0 31'14.1"E

6	20^0 49'35.7" N	85^0 31'03.6"E
7	20^0 50'05.6"N	85^0 30'37.0"E
Ash slurry and Water Corridor		
8	20^0 50'04.7"N	85^0 30'02.3"E
9	20^0 49'29.9"N	85^0 29'19.8"E
Ash dyke area		
10	20^0 48'56.7"N	85^0 29'19.8"E
11	20^0 48'25.9"N	85^0 29'38.2"E
12	20^0 48'58.9"N	85^0 30'16.5"E
13	20^0 49'35.3"N	85^0 30'14.6"E

Acquisition process for 95% of private land has been competed 75% of the compensation for the private land has already been paid to the land loosers. Proposal for alienation of Government land is under active consideration of the District Administration and completion expected shortly. OTPC is now submitting the Forest Diversion proposal over an area of 94.140 Acs or 38.098 ha of forest land for diversion out of total area of 1435.357 Acres or 580.881 ha and use the forest land for non-forestry purpose i.e. establishment of 2400 MW Super Critical Thermal Power Plant.

OTPC has made an agreement with GRIDCO for evacuation power. The copy of power purchase agreement is enclosed as **Annexure-XVII at Page- 384-395/DP.**

The Director, Mines & Geology of Odisha have confirmed non-occurrence of minerals at project site. The copy of the letter issued by Director of Geology is enclosed as **Annexure-XVIII at Page- 396-397/DP.**

The Archaeological Survey of India (ASI) has conveyed its clearance to OTPC for establishment of 2400 MW power in Kamakhyanagar Tahasil of Dhenkanal District. The clearance copy is enclosed as **Annexure-XIX at Page-398/ DP.**

The estimated maximum coal requirement will be 12.07 MTPA at 85% PLF with design GCV of 3280 kcal/ kg. The fuel shall be made available from the Tentuloicoal block/ other sources. Tentuloi coal block is located in Talcher coalfields which is about 50 km away from the project site. The coal block having 1,234 MT geological reserves for which necessary allotment was made by Government of India vide letter No. 13016/26/2004- CA-I (pt) dated 05.08.2013. However, State Government have requested Government of India to allocate an Open Cast Coal mine in the vicinity of Tentuloi Cal Block through Government Dispensation route which may be Chandapada, Machapadam, Patrapada or Mahanadi which are close to Tentuloi Coal Block. This is under active consideration of Government of India. Coal available from the new Open Cast Mine will have similar Characteristics as of Tentuloi Coal block. Coal characteristics of Tentuloicoal block are- Fixed Carbon : 24.6-27.5 %;

Moisture: 9.1-12%; Ash 35.5-44 4% Sulphur: 0.345-0.39 % and GCV: 2350-4039 kcal/kg. The coal block allocation letter is enclosed as **Annexure-XXI, at Page- 428-429/DP.**

Coal from captive mine block shall be transported through railway line up to the nearest rail head of East Coast railway i.e. Jharapada Railway Station and from there, to Sadashivpur Railway Station on Talcher-Cuttack section of SE Railway. Coal would be transported through a double track captive railway system of about 20km length. Total distance from the mine to the project site shall be around 70 km. M/s RITES have been appointed as a consultant for mapping the movement and transportation of coal from mines to project site.

Heavy Fuel oil (HFO)/ Low Sulphur Heavy Stock (LSHS) will be used for flame stabilization at low loads. LDO will be required for start-up and warm up of units. Two HFO storage tanks, each capacity 1250 m^3 and two LDO storage tanks each of capacity 550 m^3 to receive and store the unloaded fuel oils will be installed. This fuel will be transported to the plant by rail road tankers from near by depots.

The Government of Odisha, Department of water Resources vide its letter No. 8467/WR dated 11.04.2016 has accorded permission for use of 80 cusec of water from river Brahmani in favour of OPTCL for its Plant at Kamakhyanagar Tahasil in the District of Dhenkanal. The copy of letter issued by Deptt. of Water Resources is enclosed as **Annexure-XVII at Page No.430-434/DP.**

The major sources of liquid effluents, exclusive by for the proposed project is generated from Colling Tower blow Down (629, $M^3$3/h), Boiler Blow Down, Powerhouse and Boiler Area service waste water, Coal handling plant's waste water, run-off from coal pipeline area, back wash water from ETP, DM plant wastewater, etc.

Cooling Tower Blow Down will be reused for ash handling. COC is optimized to 7, to reduce CTBD and in turn consumptive water requirement. Extra CTBD water will be treated in RO plant recycling and reuse. The Guard pond will receive all treated effluents (approx. Maximum quantity of 78 m^3h) as discussed above the pond will be treated in RO plant for recycling into plant raw water treatment system. 100% reuse and recycling of liquid effluents has been considered to ensure "Zero Discharge" approach and will be ensured.

The proposed power plant will produce a fly ash of 11,111 TPD (4.05 MTPA) during its operations. For the proposed project, maximum fly ash shall be kept for Cement manufactures and about 10% will be kept for brick and other users. Utilisation of Bottom ash shall also be explored especially for using in mining voids.

As reported by DFO, Dhenkanal Division, forest land involved in the project is 38.098 ha (revenue forest Jungle-II –: 3.136 ha and Sabik Kissam forest-: 34.962 ha) and non-forest land involved is 542.7831 ha (Private land –: 331.9441 ha and Govt. land –: 210.839 ha). The authenticated land schedule of forest and non-forest land involved in the project as on 25.10.1980 are enclosed at **Page No.33-49/DP and 50-165/DP** respectively.

As reported by the DFO, Dhenkanal Division, the proposed project does not form a part of any National Park, Wildlife Sanctuary, Biosphere Reserve, Tiger Reserve, Elephant Reserve, Elephant Corridor. It is also not coming within the Eco-sensitive zone of any National Park/ Sanctuary.

There is no archaeological monument within the applied area nor there is any heritage site or defence establishment. Elephant is the most endangered fauna found in the area. No unique species of flora found in the area. The estimated cost of the project is Rs. 18,218.00 crore **(Page No.5/DP)**. As reported by the user agency, the project will generate permanent employment to 1,000 persons and temporary employment 3,000 persons. The project involves displacement of 89 families (11 SC families and 78 other families) at **Page No.9/DP.**

2. Justification for locating the project in the forest area:

Justification for locating the project at a particular place depends on several technical, commercial & social aspects which comprise mainly as follows:

(a) Adequate land for setting up the station along with ash disposal area, township & other facilities.

(b) Adequate water supply of suitable quality on year round basis including storage facility.

(c) Adequate quantity of fuel supply on sustained basis along with desired transportation logistics.

(d) Facilities of power supply/ evacuation from the station.

(e) Infrastructure facilities like road & rail access, skilled & unskilled labour, housing & civic amenities.

(f) Least diversion in rehabilitation.

(g) Lease diversion of forest land.

(h) Zero acquisition of irrigated land.

Considering the details of the 3 different alternate sites are examined in Kamakhyanagar Tahasil and Parjang Tahasil of Dist:Dhenkanal, Odisha considering the above parameter as well as Environment aspects, availability of existing rail/road, water,fuel, power evacuation facility/grid connectivity etc.

Alternate Site-A located in Kamakhyanagar Tahasil and the site is about two (2) km from Dhenkanal Kamakhyanagar major district road. It is spread over villages Villages: Sogar, Machhia, Godabhanga, Rabada, Hadagada, Kanapal, Sidhapada, Kantabania, Upar Jhagadapada, Tala Jhagadapada, Godadibili, Sogar Kateni, Sukapada, Rai Nrusinghpur and majority of which are covered under Rengali Left Ayacut area. The features of the site are as below.

1. Sufficient land is available.
2. No ecological sensitive areas within 10 km.
3. Coal Availability is 45 km away.
4. Brahmani river is about 2.5 to 3km.
5. Rail Head-Dhenkanal Rly. Station 15km away.
6. Major District road-2 km
7. Major Forest land (about 350 Acre) inside project area.
8. Major portion of land in Rengali Irrigation Ayacut.
9. Major displacement of population

Alternate Site-B located in Kamakhyanagar Tahasil and the site is adjacent to Dhenkanal-Kamakhyanagar major district road. It is spread over villages : Annapurnapur Khamar, Aluajharan, Kusumajodi, Kateni, Kantapal, Dhobabaheli, Bhagirathipur Sasan, Mahulpal, Bijadiha, Anlabareni. The features of the site is as below.

1. Sufficient land is available.
2. No ecological sensitive areas within 10 km.
3. Coal Availability is 50 km away.
4. Brahmani river is about 5 to 6 km.
5. Rail Head-Dhenkanal Rly. Station 12km away.
6. Major District road-0.5 km
7. 94.140 Acre of Forest land inside project area.
8. All land is non irrigated single crop rain fed.
9. Less displacement of population

Alternate Site-C located in Parjang Tahasil and the site is adjacent to National Highway (NH-200) and NH-23. It is spread over Villages:- Basulei, Jharan Bahal, Rangathali, Gengutia, Domuhani, Raghunathpur. The features of the site is as follows:

1. Sufficient land is available.
2. No ecological sensitive areas within 10 km.
3. Coal Availability is 60 km away.
4. Brahmani river is about 3 to 4 km.
5. Rail Head-Dhenkanal Rly. Station 5km away.

6. Adjacent to NH
7. Major Forest land (about 275 Acre) inside project area.
8. Major crop agriculture land exists in some of the area.
9. Major displacement of population.

Finally Site No. B has been selected for the project purpose at ArnapurnapurKhamar (Kha), Aluajharana, Anlebereni, Dhobabaheli, Kateni, Kantapala & Kusumajodi (7 villages) in Kamakhyanagar Tahasil in District Dhenkanal with the following advantages :

- Minimum homestead land involved. More Govt. land available.
- Mostly barren, one crop agricultural land, Minimum land grading required.
- Adequate land is available for the plant, Ash Disposal and Water Reservoir.
- Coal transportation is easy due to closeness of nearest rail head. Cost of rail connectivity shall be minimum.
- The land is above highest flood level of the area.
- No ecologically sensitive area exists within 10 km radius.
- Raw water from river Brahmani, flowing about 6 to 8 km. (approx) south of plant area.
- Project compact land can be formed from villages avoiding rengali-left ayacot.
- Minimum diversion of village forest land.
- R&R issues are minimum.

3. Maps:-

The User Agency has furnished the following maps, duly authenticated by all concerned.

Sl. No.	Particulars	Scale	Plate No.
1	Map showing project boundary Topo sheet	1:50,000	Plate -1
2	Map showing alternative sites in Topo Sheets	1:50,000	Plate-2
3	Composite Requisite Map showing Project area	1:10,000	Plate-3
4	Land use details at main plant area	Nil	Plate-4
5	Map showing landuse Pattern	1:10,000	Plate-5
6	DGPS survey map showing forest area over 38.09 ha of revenue forest land	1:6000	Plate-6
7	DGPS cadastral map of Arnapurnapur Khamar Sheet-3	1:4000	Plate- 7
8	DGPS cadastral map of Arnapurnapur Khamar Sheet-5	1:4000	Plate-8
9	DGPS cadastral map of Arnapurnapur Khamar Sheet-6	1:4000	Plate-9
10	DGPS cadastral map of Arnapurnapur Khamar Sheet-7	1:4000	Plate-10
11	DGPS cadastral map of Arnapurnapur Khamar Sheet-9	1:4000	Palet-11
12	DGPS cadastral map of Arnapurnapur Khamar Sheet-10	1:4000	Plate-12
13	DGPS cadastral map of Kusumujodi Sheet-1	1:4000	Plate-13
14	DGPS cadastral map of Alujharan Sheet-1	1:4000	Plate-14

15	DGPS cadastral map of Kateni Sheet-3	1:4000	Plate-15
16	DGPS cadastral map of Kateni Sheet-2	1:4000	Plate-16
17	DGPS cadastral map of Kateni Sheet-4	1:4000	Plate-17
18	DGPS cadastral map of Dhobabaheli Sheet-3	1:4000	Plate-18
19	DGPS cadastral map of Kantapal Sheet-2	1:4000	Plate-19
20	DGPS cadastral map of Kantapal Sheet-4	1:4000	Plate-20
21	DGPS cadastral map of CA land in village Jogidiha under Kamakhyanagar Tahasil over 9.570 ha	1:3960	Plate-21
22	DGPS cadastral map of CA land in village Kateni over 16.875 ha	1:3960	Plate-22
23	DGPS cadastral map of CA land in village Kantakhol over 12.013 ha	1:3960	Plate-23
24	CA land shown in Toposheet No.F45T9	1:50,000	Plate-24

4. Forest land:

As reported by the DFO, Dhenkanal Division the diversion proposal of 38.098 ha Revenue Forest land for construction of 3X800 MW Thermal Power Plant under Kamakhyanagar Tahasil of Dhenkanal District by OTPCL involves 16.3942 ha in ArnapurnapurKhamar (Kha), 0.1498 ha in Dhobabaheli village, 4.8159 ha in Kusumajodi village, 13.5411 ha in Kateni village, 0.344 ha in Kantapala village and 2.853 ha in Alujharan village.

Further, as per report DFO, Dhenkanal Division the instant proposal for construction of 3X800 MW Thermal Power Plant under Kamakhyanagar Tahasil of Dhenkanal District by OTPCL involves 542.7831 ha (Private land : 331.9441 ha and Govt. land : 210.839 ha) non-forest land.

The detailed land schedule of forest and non-forest land involved in the project including status of forest and non-forest land as on 25.10.1980 duly authenticated by concerned Tahasildar, Kamakhyanagar and DFO, Dhenkanal Division are enclosed at **Page No.33-49/DP and 50-165/DP** respectively.

The break-up of total land involved in this project is given below:

Sl No.	Village Name	Forest land (in ha)				Non-forest land (in ha)			Total
		RF/ PRF	Revenue Forest	Sabik Kissam Forest	Total	Govt.	Pvt.	Total	
1.	ArnapurnapurKhamar (Kha)	-	3.440	12.9542	16.3942	72.323	180.633	252.956	269.3502
2.	Dhobabaheli	-	-	0.1498	0.1498	0.959	2.3838	3.3428	3.4926
3.	Kusumajodi	-	-	4.8159	4.8159	3.853	89.5626	93.4156	98.2315
4.	Kateni	-	-	13.5411	13.5411	114.8086	10.4087	125.2173	138.7584
5.	Kantapala	-	0.08	0.264	0.344	0.652	18.4334	19.0854	19.4294
6.	Alujharan	-	-	2.853	2.853	0.182	0.4453	0.6273	3.4803
7.	Anlabereni	-	-	-	-	18.0615	30.077	48.1385	48.1385
	Grand Total		**3.520**	**34.578**	**38.098**	**210.839**	**331.944**	**542.7829**	**580.8809 or 581.881**

The component wise break up of total land required for the project is furnished below.

Sl No.	Component	Forest land (in ha)	Non-forest Pvt. land (in ha)	Non-forest Govt. land (in ha)	Total Non-forest land (in ha)	Total land (in ha)
1.	3 X 800 MW STG Building & Tr. Yard	0.000	7.009	1.474	8.483	8.483
2.	Steam Generator & Auxiliaries	0.000	10.894	8.347	19.242	19.242
3.	Chimney	0.000	0.847	2.600	3.447	3.447
4.	Switch yard	0.000	22.957	5.285	28.242	28.242
5.	Ash Handling System & F.G.D	0.000	2.677	0.372	3.050	3.050
6.	Water Treatment System	0.000	2.526	4.843	7.369	7.369
7.	Cooling Water System	0.304	9.836	10.616	20.452	20.755
8.	Coal System, MGR & Water Reservoir	0.826	70.130	13.283	83.413	84.238
9.	Rain Water Harvesting Pond	0.000	0.534	1.208	1.742	1.742
10	Fire Station/ Security	0.000	3.118	0.000	3.118	3.118
11.	Green Belt	14.480	65.218	15.851	81.068	95.548
12.	Misc BOP facilities Stores & Roads	0.000	13.831	0.917	14.749	14.749
13.	Ash pond and Ash water recycling system	19.195	49.838	119.653	169.491	188.686
14	Raw Water Corridor	2.104	21.437	5.508	26.945	29.049
15.	Ash Slurry & water corridor	0.728	11.546	1.825	13.371	14.100
16.	R&R colony (A)	0.000	9.470	0.000	9.470	9.470
17.	Enabling area for Misc Facilities	0.461	0.000	0.996	0.996	1.457
18.	Township	0.000	30.077	18.062	48.138	48.138
	Grand Total	**38.098**	**331.945**	**210.839**	**542.783**	**580.881**

The DGPS Map along with the soft copy in KML file of the proposed diversion of forest land of the project duly authenticated by the User Agency and Divisional Forest Officer, Dhenkanal Forest Division have been enclosed in the diversion proposal.

5. Flora & Fauna:

In the Part-II of diversion proposal and Site Inspection report of DFO, Dhenkanal Division the forest land proposed for diversion has been put under Eco-value class-III with density of vegetation is less than 0.4 **(Page No.21-22/DP and 23-24/DP).** In some part of the

area, there is no vegetation at all. In other part, there is very sparse vegetation comprising, Mahula *(Madhuca latifolia)*, Ambada *(Spondias mangifera)*, Arjuna *(Terminalia arjuna)*, Sal *(Shorea robusta)*, Bahada *(Terminalia belerica)*, Babul *(Acacia nilotica)*, Bara *(Ficus bengalensic)*, Bela *(Aegle marmelos)*, Chakunda *(Cassia siamea)*, Kaju Badam *(Annacardium occidentale)*, Sunajhari *(Acacia auriculiformis)* etc.

Movement of wild elephant is noticed in the project area and nearby the project area and nearby the project area. However, Python, Cobra, Sloth Bear, Deer, Wild Boar etc. often noticed in and around the project area.

6. Wildlife Management:

Site Specific Wildlife Conservation Plan:-

The area does not form part of any National Park/Wildlife Sanctuary/ Biosphere Reserve. It also does not come under any wildlife corridor. The area is coming under elephant habitat zone-2 as per ORSAC report. The movement of wild elephant is noticed in the project area.

In the Part-II of the diversion proposal, the DFO, Dhenkanal Division has reported that the User Agency has submitted the Site Specific Wildlife Conservation Plan to manage the wild elephants and other wildlife in the locality. In the meantime, the Site Specific Wildlife Conservation Plan in respect of the project has been approved by the PCCF (WL) & CWLW, Odisha, Bhubaneswar with a financial forecast of 1558.54 lakh vide letter No.11383 dated 29.12.2018 of PCCF (WL) & CWLW, Odisha **(Page No.441-442/DP)** for the following activities.

a.	For activities to be implemented by the user agency In project area	Rs.428.81 lakh
b.	For activities to be implemented in project impact area in Dhenkanal Division	Rs.1129.73 lakh
	Grand Total:	**Rs.1558.54 lakh**

However, the user agency has submitted an undertaking to pay the cost of Site Specific Wildlife Conservation Plan on demand **(Page No.443/DP)**

7. Tree enumeration:

It has been reported in the Site Inspection report **(Page No.23-24/DP)** of DFO, Dhenkanal Division that 2829 nos. of trees of different species and sizes enumerated within the forest area applied for diversion in Dhenkanal Division will be required to be felled in the proposed project purpose and impact on eco-system would not be so significant as the user agency will be leaving some trees for its Green Belt. However, the movement path of the wild elephants will be disturbed to some extent. The detailed tree enumeration carried out in

forest land has been enclosed at **Page No.205-276/DP** and the abstract of tree enumeration in girth class wise has been furnished at **Page No.202-204/DP**.

Tree enumeration has been taken up in non-forest land and 13,332 nos. of trees of different species and sizes (Kateni – 6,436 nos. , Arnapurnapurkhamar (Kha) -6,449 nos. and Kusumajodi – 447 nos.) have been enumerated. The details of enumeration of trees has been enclosed with the DP in a **separate volume**.

8. **Compensatory Afforestation:**

The forest land applied for diversion under Section-2 of FC Act is 38.098 ha. Therefore equivalent extent of non-forest land is required for compensatory afforestation.

Accordingly, an area of 38.458 ha of non-forest Govt. land has been identified in three (3) different patches in village Kateni, Kantakhol and Jogidiha under Kamakhyanagar Tahasil of Dhenkanal district in Dhenkanal Forest Division for the purpose of compensatory afforestation in lieu of diversion of forest land over an area of 38.098 ha for construction of 3 x 800 MW Super Critical Thermal Power Plant under Kamakhyanagar Tahasil of Dhenkanal district of M/s OTPCL (Odisha Thermal Power Corporation Limited). The land schedule of compensatory afforestation land allotted by Dhenkanal district revenue administration is as under:-

Name of the District	Name of the Division	Name of the Village	Khata No.	Plot No.	Kisam	CA Area (in Ha)
Dhenkanal	Dhenkanal	Kantakhol	69	476	Patharbani	3.237
				481	Patharbani	0.278
				487	Patharbani	8.498
Dhenkanal	Dhenkanal	Jogidiha	148	532	Pahad-II	9.570
Dhenkanal	Dhenkanal	Kateni	834	03	Parbat-I	16.875
					Total	**38.458**

The land schedule for identified non-forest land for compensatory afforestation duly authenticated by Tahasildar, Kamakhyanagar is enclosed at **Page No.167/DP**. The identified CA land has been depicted in Survey of India Toposheet No.F45T9 indicating the identified CA land is appended as **Plate No.24/DP**. The DGPS map of the compensatory afforestation land is appended as **Plate No.21-23/DP**. The DFO, Dhenkanal Division has furnished the land suitability certificate which is enclosed at **Page No.169/DP.** The Tahasildar, Kamakhyanagar and DFO, Dhenkanal Division have certified that the identified land is free from encroachment and encumbrance and not covered under DLC report which is enclosed at **Page No.168/DP.**

A compensatory afforestation scheme has been prepared by DFO, Dhenkanal Division in which it has been proposed to take up Bald hill plantation over 12.013 ha @1600 plants per ha with 10 year maintenance alongwith vegetative fencing around the plantation

and ANR with Gap Plantation @800 plants per ha over 26.445 ha (9.570 ha in Jogidiha village and 16.875 ha in Kateni village) with 10 years maintenance and provision of soil & moisture conservation by constructing staggered tranches and Loose Boulder Check Dam (LBCD) which is enclosed at **Page No.169-201/DP**. The species selected for plantation under compensatory afforestation scheme include *Tectona grandis* (Teak), *Emblicaofficinalis* (Amla), *Terminalia belerica* (Bahada), *Simarouba glauca* (Simaruba), *Dendrocalamus strictus* (Bamboo), *Ficus bengalensis* (Bara), *Alstonia scholaris* (Chhatian), *Dalbetgia sisoo* (Sisoo), *Cassia fistula* (Sunari), *Pongamia pinnata* (Karanja), *Ficus benjamina* (Jari), *Syzygium cumini* (Jamun), *Mengifera indica* (Mango), *Azadiracta indica* (Neem), *Tamarindous indica* (Tentuli), *Albizzia lebbeck* (Sirisa) and *Strychnos nuxvomica* (Kochila). The compensatory afforestation has been technically approved by Addl.PCCF (FD & NO, FC Act) with a total financial outlay of Rs.1,57,38,000/- at current wage rate of Rs. 280/- per manday which is enclosed at **Page No. 200 A/DP.**

The User Agency has furnished an undertaking to pay the entire amount for compensatory afforestation in lieu of the forest land to be diverted for construction of 3 X 800 MW Coal Based Super Critical Thermal Power Plant by Odisha Thermal Power Corporation Ltd as per prevailing wage at the time of plantation which is enclosed at **Page No.439/DP.**

9. Cost benefit analysis:

As submitted by the User Agency the total benefit of the project comes to Rs. 31212.68493 crores and the loss in forest including Environmental loss, NPV cost etc comes to Rs.72.29855 crores. Hence, the cost benefit ratio is 1:431.72 **(Page No.29-30/DP).**

10. Environmental Clearance:

Terms of Reference (ToR) has been considered for construction of 3 X 800 MW Coal Based Super Critical Thermal Power Plant to M/s OPTCL vide letter No.J-13012/48/2012/IA. II (T) dated 05.03.2013 of Govt. of India, MoEF & CC, New Delhi. Accordingly EIA report was prepared and submitted the EIA report to Odisha SPCB. The Public Hearing was conducted by SPCB on dated 05.08.2014 which is presided by PD DRDA Dhenkanal who was in change of ADM. The EIA report along with Public Hearing. Proceeding was forwarded by SPCB to MoEF & CC. The EIA report was placed before EAC on dated 29.05.2017. However the grant of Environmental Clearance is under active Consideration by MoEF &CC. The copy of the ToR and the copy of the public hearing proceeding are enclosed at **Page No.399-427/DP**.

The User Agency has furnished an undertaking to submit the Environmental clearance copy before Stage-II/ final forest clearance which is enclosed at **Page No.427 A/DP.**

11. Rehabilitation & Resettlement Plan:

Socio Economic Survey of the project area has been completed by M/s Xavier Institute of Management, Bhubaneswar. Apart from other issues, 133 families are to be displaced from the project area. All the families to be displaced are residing in villages of Marichakona and Nuagaonbila. This two villages are located inside the main plant area. However, a number of families have represented that they have been left out during the survey. It is estimated that a number of families to be displaced may increase to about 160. It is imperative that the displaced families are to be rehabilitated as per the LA R&R Act, 2013 and the State Government's Resettlement and Rehabilitation Policy, 2006 before any work in the main plant area can be started. The User Agency has submitted the Plan for Rehabilitation and Resettlement of displaced families which is enclosed at **Page No.435-438/DP.** It is reported by the DFO, Dhenkanal Division in the Site Inspection report **(Page No.23-24/DP)** that the R&R Plan has been approved by RPDAC meeting and accordingly OTPCL shall compensate towards rehabilitation of displacement people.

The User Agency has furnished an undertaking to submit the copy of approved R&R Plan before execution of the project activities. **(Page No.438 A/DP)**

12. NPV (Net Present Value):

The User Agency has furnished an undertaking to pay the NPV of the forest land proposed to be diverted as per demand of DFO, Dhenkanal Division which is enclosed at **Page No.440/DP**. Further, the user agency has also furnished an undertaking to pay the additional amount of NPV if so, determined as per decision of the Hon'ble Supreme Court of India which is enclosed at **Page No.440 A/DP.**

13. DGPS Map:

Ministry of Environment and Forests, GoI in their letter No. F. No.11-9/98 dated 08.07.2011 have issued guidelines that all application seeking prior approval of the Central Govt. under the Forest (Conservation) Act, 1980 for diversion of forest land for non-forest purpose, must be accompanied with Geo-reference boundary in shape file. Further, in the guideline, it is said that to ensure accurate delineation of the forest area to be diverted, the application should also contain authenticated copy of digital map along with hard copy. Accordingly, the User Agency has submitted the required digitalized map duly verified by ORSAC and authenticated by DFO, Dhenkanal Division, which is enclosed to the diversion proposal as **Plate No.6-20/DP** alongwith Shape file and KML file. The soft copy of DGPS map of the forest area proposed for diversion in CD form is enclosed with the DP.

14. **Violation:**

As reported by the DFO, Dhenkanal Division in his Site Inspection report **(Page No.23-24/DP)**, no violation has been committed by the User Agency under Forest (Conservation) Act, 1980.

15. **Certificate under Forest Right Act, 2006:**

The Collector & District Magistrate, Dhenkanal has issued the required certificate under Forest Right Act, 2006 in the prescribed format in Form-II for the proposed area for diversion of 38.098 ha communicated vide letter No.2378 dated 27.11.2018 of District Welfare Officer, Dhenkanal alongwith proceedings of DLC, SDLC and Gram Sabha resolutions relating to villages Arnapurnapur Khamar (kha), Alujharan, Kusumjodi, Dhobabaheli, Kantapal and Kateni both in Odia and English version which are enclosed at **Page No. 278-352/DP.**

In the proceeding of Gram Sabha resolution of village Dhobabaheli held on 21.03.2018 . It has been mentioned that one Sri Sankhali Sahu , S/o Brajabandhu has unauthorisedly encroached the hal –sabik kisam and identified land in Plot No.2748/3119 under Khata No.169 for which encroachment case has been instituted against him vide e-case No.212/2012-13. The documentary evidence in this regard is enclosed at **Page No.307-318/DP.** In this regard the User Agency has furnished an undertaking to pay as per the provision of Right to Fair Compensation & Transparency in Land Acquisition, Rehabilitation & Resettlement Act, 2013. Which is enclosed at **Page No.318 A/DP.**

16. **Others:**

Part-II, Part-III and Site Inspection Reports are enclosed in the DP **(Page No.21-22/DP, 24A/DP and 23-24/DP respectively**. The Division Profile, District Profile and State Profile have been furnished at **Page No.444 /DP**, **Page No. 445/DP** and **Page No. 446/DP** respectively.

17. **Recommendation:**

In view of the above, the proposal for diversion of 38.098 ha Revenue Forest land for construction of 3X800 MW Thermal Power Plant under Kamakhyanagar Tahasil of Dhenkanal District by OTPCL is sent herewith in triplicate for consideration of the Government and onward transmission to Government of India, Ministry of Environment Forest & Climate Change for approval under Section-2 of Forest (Conservation) Act, 1980 on its own merit.

Yours faithfully,

Encl: Diversion Proposal
in triplicate (3) sets

Principal Chief Conservator of Forests
Odisha 27/2/19

Memo No. Date.

Copy forwarded to the Additional Principal Chief Conservator of Forests, Angul Circle for information & necessary action with reference to his Memo No.358 dated.24.01.2019.

Additional Principal Chief Conservator of Forests
Forest Diversion & Nodal Officer, F.C. Act
28/2/19

Memo No. Date.

Copy forwarded to the Divisional Forest Officer, Dhenkanal Forest Division for information & necessary action with reference to Memo No.359 dated 24.01.2019 of Addl.PCCF, Angul Circle to his address.

Additional Principal Chief Conservator of Forests
Forest Diversion & Nodal Officer, F.C. Act
28/2/19

LOCATION OF COMPENSATORY AFFORESTATION LAND OVER AN AREA OF 38.458 HA IN NON FOREST LAND IN VILLAGE KATENI,KANTAKHOL & JOGIDIHA UNDER DHENKANAL FOREST DIVISION IN LIEU OF DIVERSION OF 38.098 HA OF FOREST LAND FOR THERMAL POWER PLANT OF OTPCL AT KAMAKHYANAGAR,ODISHA

Annexure VI

OPEN SERIES MAP

No. F45T9

Scale 1:50,000

Angul ORISSA F45N8 (73G/8)	Kenduljhar ORISSA F45N12 (73G/12)	F45N16 (73G/16)
F45T5 (73H/5)	Dhenkanal ORISSA F45T9 (73H/9)	Jajapur ORISSA F45T13 (73H/13)
F45T6 (73H/6)	F45T10 (73H/10)	F45T14 (73H/14) Cuttack ORISSA

सर्वेक्षण विभाग SURVEY OF INDIA

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CONVENTIONAL SYMBOLS

REFERENCES

NOTES :-

COMPILATION INDEX

Projection – UTM Datum – WGS 84

Magnetic Variation from True North about 3/4° West in 2005. (Annual change negligible).

1:50,000

CONTOUR INTERVAL 20 METRES

For further details about this map, please contact

Director
Orissa Geo-Spatial Data Centre
Survey of India,
Survey Bhawan, PO – R.R. Laboratory

ANANTAPUR RESERVED FOREST
ANANTAPUR R F
MADHI R F
JIRIDAMALI RESERVED FOREST
JIRIDAMALI R F
MAHULABHANJA RF A BLOCK
MAHULABHANJA RESERVED FOREST B BLOCK
TIPILEI RESERVED FOREST
KAMAKHYANAGAR
SUNAMARU RESERVED FOREST
SUNAMARU R F
SUNAJHARI RESERVED FOREST
SUNAJHARI R F
SUNDARAKHOL R F
ANLABERENI R F
BHAIRIPUR R F
MACHHIA RF
RUPABALIA RESERVED FOREST
BRAHMANI RIVER
Left Bank Canal under construction
COMPENSATORY AFFORESTATION LAND

Legend

CA LAND BOUNDARY