FOREST LAND DIVERSION OF DUDHICHUA OPENCAST PROJECT-NCL

EVALUATION OF LOSS OF FORESTS

CALCULATION DETAILS

Sl No	Details	Description
1	Project	Dudhichua Project-NCL
		Tehsil: Singrauli
		District: Singrauli
		State: Madhya Pradesh
2	Forest Range	Waidhan
3	Forest Compartment	261 &262
4	Forest Land Needed (in ha)	467.809
5	Quality	V B
6	Total Number of Trees (Annexure - A&B)	15037
7	Average Density of Forest	0.2
8	Estimated Total volume (Cmt) (Annexure-A&B)	**9117.45**
(a)	Total Timber Volume (Cmt) (Annexure-A&B)	2925.10
(b)	Total **Fuel** Volume (Cmt) (Annexure-A&B)	6192.35

(A) ITEM-1

Evaluations of loss Timber Fuel Minor Forests Produce Mandays Expectation or Potential Value of Soil for Forest Land

S.no	Particulars	Dudhichua Project-NCL	
a	Value of Timber @ Rs.18000/-	Rs.	52651800.00
	Value of Fuel @ Rs.2100/-	Rs.	13003935.00
	Total Market Price-(M)	Rs.	**65655735.00**
	Per Hect value-	Rs.	**140347.31**
b	**Value of Minor Forests produce (Revenue per hectare* x area applied for in Hectare)**	Rs.	**1685983.64**
c	Cost of Coupe working (Mandays per ha x Area x 263)	Rs.	**30299321.05**
	Total Cost per Hectare	Rs.	64768.57
	Mandays per Hectare (Cost per Hectare/Daily Wages)	*Mandays per Ha*	246.27
	Reciprocal Value (1.04P^{n-1}) where P= rate of interest=12%, N=period of rotation=30Years		2.324
	Upset price of Forest growth (R) (R=5/6M-E) where M= Market price and E= Expenditure in Rs	**Rs.**	29463678.30
d	**Expectation of Potential Value of soil (Upset PriceXReciprocal Value)**	**Rs.**	**68473588.36**
	Revenue Obtained From Intermediate Yield	**Rs.**	Nil
e	Fire Protection Charges (C) (C=25*R"*A) where R"=Fire Protection Expenditure Per Hectare i.e Rs 1052 per Ha; A=Area in 467.809 Ha. in Rs	**Rs.**	**12303376.70**
	Total (a+b+c+d+e)	**Rs.**	**178418004.74**

[*] Average Annual revenue from MFP in division is Rs.3604 per hectare (Total Annual Revenue from MFP in div. Rs. 8000 lakhs/Total Forest area of the div. 221965 hectare)

FORM-B:

Details of Expenditure

Particular of Work	Amount of work	Unit	Rate in (Rs.)	Cost (in Rs.)
Felling,Collection upto Extraction path				
Felling of Timber, debarking and other Works	2925.10	Cmt	3156	9231615.60
Felling of fuel Wood	2064.12	Cmt	3156	6514352.20
Recording				
Other Expenditure Material ,E P,W &Ward etc				
A) Timber	2925.10	Cmt	1052	3077205.20
B) Fuel Wood	2064.12	Cmt	1052	2171450.73
Transportation upto market including loading, unloading (Market Bargawan depot avg. lead 48 km)				
A) Timber	2925.10	Cmt	1100	3217610.00
B) Fuel Wood	6192.35	Cmt	750	4644262.50
			Total =	**28856496.23**
			5% Extra for labour rate changes:-	**1442824.81**
			Total Expenditure (E)=	**30299321.05**
			Expenditure per Hectare=	**64768.57**

UPSET PRICE FORM 'C'

Upset Price =5/6 M-E   M=Market Price   E= Expenditure

(A) ITEM-1 Upset price in Rs.	Rs	**29463678.30**

(B) ITEM-2 Loss Value of Fodder (Grass)

(i) Estimate quantity of grass in metric tones based on the consideration that on closure, an area is capable of yielding an average 2 to 4 mt of grass per Ha		Annual Production x Area Applied
	=	1403
Loss of loss of fodder Average in local market @ Rs 1080 per mt	Rs	1515701.16

(C) ITEM-3 Cost of Human Re-Settlement

The forest land is not to be used for the Rehabilitation of displaced persons. Hence the cost of human settlement is Nil.There is no habitation therefore on settlement will be applied.

(D) ITEM-4 Loss of Public Facilities and Administrative Infrastructure

There is no loss of forest road, nakas and other construction in the applied area.

(E) ITEM-5 Valuation of Environmental Losses

Environmental loss over a period of 50 year		Standard loss per Ha.in fully stocked forest X Area applied for X Avg forest density
	Rs.	1185802253
Environmental loss per year	Rs.	23716045.06

(F) ITEM-6 Suffering to Outstees

Suffering to Outstees	Nil

CALCULATION OF COMPENSATION FOR THE FOREST LAND

Amount of compensation has been decided as per instructions contained in the Govt. of MP Forest Dept.

COMPENSATION OF LAND INCLUDES		
Area of Forest Land in Ha.	467.809	
1. Expectation as Potential value of soil i.e.		
Co	R/ (1.04 P^N-1)	
R	Upset price of Standing growth (Rs)	
P	Rate of Interest =12%	
N	Period of Rotation =30 years	
Reciprocal value of (1.04 P^N-1)	2.324	
Potential value of Soil	Rs	68,473,588

2. Upset price of Standing Growth i.e. includes value of Timber and fuelwood		
Upset Price	Rs.	29,463,678

3. Potential Revenue from Minor forest Product		
C	25*R*A	
Where R	Revenue per Ha./Acre from MFP (Rs. 3.00 per Acre)	
Where A	Area of 467.809 hectare	
Hence C	Rs.	86,661.62

4. Fire Protection Charges		
C	25 *R*A	
Where R	Fire Protection charges per Ha/ Acre (Rs.20 /-per Acre per Year)	
A	Area of 467.809 hectare	
Hence C	**Rs**	**577,744.12**

5.Rehablitation Charges i.e. Rs 10,000/ ha as per Govt. of MP forest	**Rs**	**4,678,090.00**
TOTAL COMPENSATION	**Rs.**	**103,279,762**

Waidhan Range

Dudhichua Project

(Site Quality V B)

Compartment No:PF 261, 262 Number of Plots 517 = 443.00 Hact

Revenue forest 404,410,411,412,172,188,193 Number of Plots = 25 = 24.809ha

Compartment No 261,262+ Revenue Forest 404,410,411,412,172,188,193 = (443ha + 24.809ha = 467.809ha)

Sr No:	Species	Girth Class	No of trees	Timber Factor	Timber Quantity in cmt	Fuel Factor	Fuel Quantity in cmt	Total Quantity in cmt
1	Sound	21-30	311	0.010	3.11	0.0025	0.78	3.89
2		31-40	313	0.030	9.39	0.0075	2.35	11.74
3		41-60	239	0.050	11.95	0.0125	2.99	14.94
4		61-80	51	0.120	6.12	0.0300	1.53	7.65
5		81-100	13	0.200	2.60	0.0600	0.78	3.38
6		101-120	6	0.300	1.80	0.0750	0.45	2.25
7		121-150	1	0.410	0.41	0.1025	0.10	0.51
8		151-180	1	0.580	0.58	0.1450	0.15	0.73
9		180+	1	0.800	0.80	0.2000	0.20	1.00
	Sub Total		936		36.76		9.32	46.08
1	Semi Sound	21-30	12	0.010	0.12	0.0100	0.12	0.24
2		31-40	151	0.020	3.02	0.0300	4.53	7.55
3		41-60	442	0.040	17.68	0.0500	22.10	39.78
4		61-80	276	0.090	24.84	0.0600	16.56	41.40
5		81-100	95	0.150	14.25	0.1000	9.50	23.75
6		101-120	32	0.230	7.36	0.1500	4.80	12.16
7		121-150	13	0.310	4.03	0.2050	2.67	6.70
8		151-180	7	0.440	3.08	0.2900	2.03	5.11
9		180+	8	0.600	4.8	0.4000	3.20	8.00
	Sub Total		1036		79.18		65.51	144.69
1	Un Sound	21-30	3372	0	0	0.0100	33.72	33.72
2		31-40	3227	0.01	32.27	0.0300	96.81	129.08
3		41-60	4223	0.01	42.23	0.0500	211.15	253.38
4		61-80	1475	0.03	44.25	0.0600	88.50	132.75
5		81-100	463	0.05	23.15	0.1000	46.30	69.45
6		101-120	129	0.08	10.32	0.1500	19.35	29.67
7		121-150	82	0.1	8.2	0.2050	16.81	25.01
8		151-180	53	0.15	7.95	0.2900	15.37	23.32
9		180+	41	0.2	8.2	0.4000	16.40	24.60
	Sub Total		13065		176.57		544.41	720.98
	Total		15037		292.51		619.24	911.75
Total from 443+24.809 Ha (cmt) = 467.809			150370		2925.10		6192.35	9117.45

DUDHICHUA PROJECT-NCL

PARAMETERS FOR EVALUATION OF BENEFITS, NOTWITHSTANDING LOSS OF FOREST

Sl. No.	Parameters	Description	Calculation	Benefit (in Rs. crores)
1	Benefit from coal produced over a period proposed in the Expansion project report EPR-15 MTY (24years as on 01.04.2014)	Total 215 Million Tonnes of coal will be produced aditionally which is expected to give a profit of :	215(MT) x 260.48(Project profit per tonne as per EPR-15MTY)	5600.32
2	Benefits to economy	A total of 215 Million Tonnes of coal from Dudhichua Project will be produced. The Govt. will be benefited by Royalty & Taxes will shall be Rs. 4063.50 crores as per rate applicable today. Taxes includesED 6%, Higher EDU 1% on ED SED Rs 10/Te, Clean Energy cess Rs 50/Te MPGSTVA-5%, , VAT-4%, Entry tax 2% and Royality 14% of value of coal.	Approx 30.18% & Rs 67- per tonne of the basic sale value (Basic Sale value as on date is Rs 761.35)	4312.70
	Benefit in terms of electricity generation	A total of 15 Million tonnes of coal will be produced annually from Dudhichua Project will be used for power generation, taking average annual generation of 21.539 x 10^9 (units) for 15MT total benefit in Rs comes to :	24(yrs.)x (21.539 x$10^{9)}$(units) x rs. 0.21 (Income per unit)	10855.66
4	Employment potential	About 615 direct employment in mine & 500 in-direct employment through other services.	(215+500)(manpower) x 24(yrs.)x 365(days)x 8(shift hours)x Rs. 30 (per manhour)	150.32
5	Cost of acquisition of facility on non-forest land wherever feasible	There is no scope of diversion of the non-forest area as coal deposited laying under forest area can not be left out of mining		
6	Loss of (a) agriculture & (b) animal husbandry production due to diversion of forest land.	Loss of fodder is assessed in Form C (item no-B) but there is no husbandry production in the area.	Loss is deducted form benefits	-0.15157012
7	Cost of rehabilitation of the displaced persons as different from compensatory amount given for displacement	There is no population in the forest land.		
8	Cost of supply of free fuel wood to workers residing in or near forest area during the period of construcitons.	Not applicable - As free coal is supplied to the workers of company for domestic use.		
9	**Total benefits in Crores**			**20919.00**

COST-BENEFIT RATIO

(A)	**Loss of Forest**		Rs. Crores.	17.84
(B.1)	Cost benefit ratio in terms of cost of Coal produced	(Benefit / loss of forest)=Rs. 5600.32 crores/ Rs.17.84crores=	**313.92**	**times profit**
(B.2)	Cost benefit ratio in terms of royalty/taxes to govt.	(Benefit / loss of forest)=Rs4312.70crores/ Rs.17.84 crores=	**241.74**	**times profit**
(B.3)	Cost benefit ratio in terms of Electricity generation	(Benefit / loss of forest)=Rs10855.66 crores/ Rs.17.84 crores=	**608.50**	**times profit**
(B.4)	Cost benefit ratio in terms of employment generation	(Benefit / loss of forest)=Rs.150.32 crores/ Rs.17.84 crores=	**8.43**	**times profit**
(B.5)	Cost benefit ratio in terms of **Total benefits**	(Benefit / loss of forest)=Rs.16845.29crores/ Rs.17.84 crores=	**1172.59**	**times profit**

<table>
<tr><th colspan="10">DUDHICHUA PROJECT- NCL</th></tr>
<tr><th colspan="10">Summary Sheet of All the Forest Land (Both Notification and Revenue)</th></tr>
<tr><th rowspan="2">Sl. No.</th><th rowspan="2">Particulars</th><th rowspan="2">Row No.</th><th rowspan="2">Formula / Calculation</th><th rowspan="2">Unit</th><th colspan="2">Summary Sheet of All the Forest Land (Both Notification and Revenue)</th><th rowspan="2">Total</th><th rowspan="2">Revenue forest</th><th rowspan="2">Total</th></tr>
<tr><th>PF 261</th><th>PF 262</th></tr>
<tr><td>1</td><td>Forest land to be diverted (in ha)</td><td>1</td><td></td><td>Ha</td><td>256.746</td><td>186.254</td><td>443</td><td>24.809</td><td>467.809</td></tr>
<tr><td>2</td><td>Quality</td><td>2</td><td></td><td></td><td>V B</td><td>V B</td><td></td><td>V B</td><td></td></tr>
<tr><td>3</td><td>Total Number of Trees (Annexure - A&B)</td><td>3</td><td></td><td>Nos.</td><td>8606</td><td>6353</td><td>14959</td><td>78</td><td>15037</td></tr>
<tr><td>4</td><td>Average Density of Forest</td><td>4</td><td></td><td></td><td>0.3</td><td>0.4</td><td></td><td>0.2</td><td></td></tr>
<tr><td>5</td><td>Estimated Total volume (Cmt) (Total Timber Volume (Cmt)+1 x (Total Fuel Volume (Cmt))</td><td>5</td><td></td><td>Cmt</td><td>5003.90</td><td>3630.03</td><td>8633.93</td><td>483.51</td><td>9117.44</td></tr>
<tr><td>6</td><td>Total Timber Volume (Cmt) (Annexure-A&B)</td><td>6</td><td></td><td>Cmt</td><td>1605.37</td><td>1164.60</td><td>2769.98</td><td>155.12</td><td>2925.10</td></tr>
<tr><td>7</td><td>Total Fuel Volume (Cmt) (Annexure-A&B)</td><td>7</td><td></td><td>Cmt</td><td>3398.53</td><td>2465.43</td><td>5863.96</td><td>328.39</td><td>6192.35</td></tr>
<tr><th colspan="10">(A) ITEM-1 Evaluation of loss Timber Fuel Minor Forests Produce Mandays Expectation or Potential value of soil for Forest Land</th></tr>
<tr><td rowspan="4">a</td><td>Value of Timber @ Rs 18000/-</td><td>8</td><td>Rs.18000 x Row 6</td><td>Rs.</td><td>28896705.80</td><td>20962846.71</td><td>49859552.51</td><td>2792247.49</td><td>52651800.00</td></tr>
<tr><td>Value of fuel @ Rs 2100/-</td><td>9</td><td>Rs.2100 x Row 7</td><td>Rs.</td><td>7136913.00</td><td>5177403.00</td><td>12314316.00</td><td>689619.00</td><td>13003935.00</td></tr>
<tr><td>Total Market price (M)</td><td>10</td><td>Row 8 + Row 9</td><td>Rs.</td><td>36033618.80</td><td>26140249.71</td><td>62173868.51</td><td>3481866.49</td><td>65655735.00</td></tr>
<tr><td>Per Hect value</td><td>11</td><td>Row 10/Row 1</td><td>Rs.</td><td>140347.34</td><td>140347.32</td><td>140347.33</td><td>140346.91</td><td>140347.31</td></tr>
<tr><td>b</td><td>Value of Minor of Forests produce (Revenue per hectare x area applied for in hectare)</td><td>12</td><td>Rev/Ha.(Rs.800000000/221965) x Row 1</td><td>Rs.</td><td>925313</td><td>671259</td><td>1596572</td><td>89412</td><td>1685983.64</td></tr>
<tr><td rowspan="4">c</td><td>Cost of Coupe working (Mandays per ha x Area x daily wages i.e. Rs. 263)</td><td>13</td><td>Row 30</td><td>Rs.</td><td>16629081</td><td>12063408</td><td>28692488</td><td>1606833</td><td>30299321.05</td></tr>
<tr><td>Total cost per hectare</td><td>14</td><td>Row 30/Row 1</td><td>Rs.</td><td>64768.61</td><td>64768.58</td><td>64768.60</td><td>64768.14</td><td>64768.57</td></tr>
<tr><td>Mandays per hectare(cost per hectare/Daily Wages)</td><td>15</td><td>Row 14/263</td><td>Nos</td><td>246.27</td><td>246.27</td><td>246.27</td><td>246.27</td><td>246.27</td></tr>
<tr><td>Reciprocal value (1.04P) where P= rate of interest = 12%, N=period of rotaion = 30 years</td><td>16</td><td></td><td>value</td><td>2.324</td><td>2.324</td><td></td><td>2.324</td><td></td></tr>
<tr><td rowspan="3">d</td><td>Upset price of Forest growth (R) (R=5/6M-E) where M= Market price and E = Expenditure in Rs</td><td>17</td><td>Row 32</td><td>Rs.</td><td>16170448</td><td>14730702</td><td>27901150</td><td>1562528</td><td>29463678.30</td></tr>
<tr><td>Expectation of potential value of soil (Upset Price x Reciprocal Value)</td><td>18</td><td>Row 32 x Row 16</td><td>Rs.</td><td>37580122</td><td>27262151</td><td>64842273</td><td>3631315</td><td>68473588.36</td></tr>
<tr><td>Revenue Obtained from intermediate yield</td><td>19</td><td>nil</td><td>Rs.</td><td></td><td></td><td>0</td><td></td><td></td></tr>
<tr><td>e</td><td>Fire protection charges (C) (C=25"R"A) where R=Fire protection expenditure per hectare i.e. Rs 1052.00 per hectare</td><td>20</td><td>25*1052*Row1</td><td>Rs.</td><td>6752420</td><td>4898480</td><td>11650900</td><td>652477</td><td>12303376.70</td></tr>
<tr><td colspan="2">Total of Item – 1 (a+b+c+d+e)</td><td>21</td><td>Row25+ Row12 Row 13 +Row 18 +Row 20</td><td>Rs.</td><td>97920554</td><td>71035548</td><td>168956102</td><td>9461903</td><td>178418004.74</td></tr>
</table>

DUDHICHUA PROJECT- NCL

Summary Sheet of All the Forest Land (Both Notification and Revenue)

Sl. No.	Particulars	Row No.	Formula / Calculation	Unit	Summary Sheet of All the Forest Land (Both Notification and Revenue)		Total	Revenue forest	Total
					PF 261	PF 262			
Form- B: Details of Expenditure									
Felling,Collection upto Extraction path									
(i)	Felling of Timber, debarking and other Works	22	Row 6 x 12 (Mandays) x Rs.(daily wages) 263		5066555.75	3675485.79	8742041.54	489574.06	9231615.60
(ii)	Felling of fuel Wood	23	(Row 7 x 1/3) x 12(mandays)x Rs. 263 (daily wages)	Rs.	3575253.56	2593632.36	6168885.92	345466.28	6514352.20
Other Expenditure Material ,E P,W &Ward etc									
(A)	Timber	24	Row 6 x 4(mandays) x Rs.263(daily wages)	Rs.	1688851.92	1225161.93	2914013.847	163191.35	3077205.20
(B)	Fuel Wood	25	(Row 7 x 1/3) x 4(mandays)x Rs. 263 (daily wages)	Rs.	1191751.19	864544.12	2056295.31	115155.43	2171450.73
Transportation upto market including loading, unloading (Market Bargawan depot avg. lead 48 km)									
(A)	Timber	26	Row 6 x Rs. 1100	Rs.	1765909.80	1281062.85	3046972.65	170637.35	3217610.00
(B)	Fuel Wood	27	(Row 7 x 1) x Rs.750	Rs.	2548897.50	1849072.50	4397970	246292.50	4644262.50
Total		28	Row 22+ Row 23+ Row 24+Row 25 + Row 26 + Row 27	Rs.	15837219.71	11488959.55	27326179.27	1530316.97	28856496.23
5% Extra for labour rate changes:-		29	(5/100) x Row 28	Rs.	791860.99	574447.98	1366308.96	76515.85	1442824.81
Total Expenditure (E)		30	Row 28 + Row 29	Rs.	16629080.70	12063407.53	28692488.23	1606832.81	30299321.05
Expenditure per Hectare		31	Row 30/Row 1	Rs.	64768.61	64768.58	64768.60	64768.14	64768.57
FORM 'C' (Upset Price = 5/6 M-E M=Market Price E = Expenditure)									
(A)ITEM-1 Upset price in Rs 32		32	5/6 x Row 10-Row 30	Rs.	16170448.42	11730701.82	27901150.23	1562528.063	29463678.3
(B) ITEM-2 Loss Value of Fodder (Grass)									
(i)Estimate quantity of grass in metric tones based on the consideration that on closure, an area is capable of yielding an average 2 to 4 m of grass per Ha.		33	3 mt x Row 1	mt	770	559	1329	74	1403
Loss of loss of fodder average in local market @ Rs 1080 per mt		34	Rs 1080 x Row 33	Rs.	831857.04	603462.96	1435320	80381.16	1515701.16
(C) ITEM-3 Cost of Human Re-Settlement									
The forest land is not to be used for the Rehabilitation of displaced persons. Hence the cost of human settlement is NIL		35	nil	Rs.	nil	nil		nil	nil
(D) ITEM-4 Loss of Public Facilities and Administrative Infrastructure									
There is no loss of forest road, nakas and other construction in the applied area.		36			nil	nil		nil	nil
(E) ITEM-5 Valuation of Environmental Losses									
Environmental loss over a period of 50 year Standard loss per Ha. In fully stocked forest (Rs 126.74 lakh) x Area applied for X Avg forest density		37		Rs.	650799761	472116639	1122916400	62885853	1185802253
Environmental loss per year		38		Rs.	13015995.22	9442332.78	22458328.00	1257717.06	23716045.06
(F) ITEM-6 Suffering to Outstees									
Suffering to Outstees		39			nil	nil		nil	nil

DUDHICHUA PROJECT- NCL

Summary Sheet of All the Forest Land (Both Notification and Revenue)

Sl. No.	Particulars	Row No.	Formula / Calculation	Unit	Summary Sheet of All the Forest Land (Both Notification and Revenue)		Total	Revenue forest	Total
					PF 261	PF 262			
CALCULATION OF COMPENSATION FOR THE FOREST LAND Amount of compensation has been decided as per instruction contained in the Govt. of MP Forest Dept.									
1. Expectation as Potential value of soil									
	Reciprocal value of (1.04 PN-1)	40	Row 16	value	2.324	2.324		2.324	
	Potential value of Soil	41	Row 32 x Row 16	Rs.	37580122.12	27262151.02	64842273.14	3631315.218	68473588.36
2. Upset price of Standing Growth i.e. Includes value of Timber and fuelwood									
	Upset Price	42	Row 32	Rs.	16170448.42	11730701.82	27901150.23	1562528.063	29463678.30
3. Potential Revenue from Minor forest Product									
	C	43	25 x Rs 3 x Row 1 x 2.47	Rs.	47562.2	34503.55	82065.75	4595.87	86661.62
4. Fire Protection Charges									
	C	44	25 Rs 20 x Row 1x 2.47		317081.31	230023.69	547105.00	30639.12	577744.12
	5. Rehabilitation charges i.e. Rs 10,000/ha as per Govt. Of MP forest	45	Rs 10000 x Row 1	Rs.	2567460	1862540	4430000	248090	4678090.00
	Total Compensation	**46**	**Row 41 + Row 42 + Row 43 +Row 44 Row 45**	**Rs.**	**56682674**	**41119920**	**97802594**	**5477168**	**103279762**