

Annexure No. I

Jagdishpur-Haldia-Bokaro-Dhamra Gas Pipeline Project, Bokaro-Angul (BAPL) Odisha Section Phase-II

Evaluation of Loss of Forest

(As per Forest (Conservation) Rules 6, From 'A' S. No. 1 (V) and Guidelines - application of Forest Act 1980, Chapter -II (2.6))

Sr. No.	Parameters	Analysis				
		S.No.	No of Trees	Quantity (m ³)	Amount (Lacs)	Remark
1	Parameter - 1	The losses due to timber and fuel wood.				
	Loss of value of timber, fuel wood and minor produce on an annual basis including loss of man hours per annum of the people who are of deprived livelihood and wages from the harvest of these commodities (To be quantified & expressed in monetary terms)	1	10616	646.19	42.14	As per Annexure A attached (Timber Loss has been calculated @ maximum rate considering all trees as Teak)
		Total Losses due to Timber & fuel wood considering increment in trees over 50 year including compound interest at Indian economy Rate at 6 % works out to = $42.14 (1+6/10)^{50}$				
		= 734.08 Lakhs				
2	Parameter - 2	The Forest area 65.4036 Ha. Proposed to be diverted is devoid of good quality of grasses. It is estimated that the grass production will be 0.5 MT per Ha. Per year. Therefore, the total production of grasses from 65.4036 Ha. For 50 years will be				
	Loss of animal husbandry productively including loss of fodder (To be quantified & expressed in monetary terms)	Area 65.4036 Ha X 0.50 = 32.7018 MT Production per year				
		Cost of Grass @Rs. 1500/ per M.T. will be Rs. 49052.70/-				
		Total Loss for 50 years will be Rs. 24.53 Lacs				
3	Parameter - 3					
	Cost of human resettlement (To be quantified & exposed in monetary terms)	As No population is affected due to the project no human resettlement is required				
		NIL				
4	Parameter - 4					
	Loss of public facilities and administrative infrastructure (Roads buildings, schools, dispensaries, electric lines, railways etc) on forest land or which would require facilities were diverted due to project (To be quantified & expressed in Monetary terms)	As no public facilities and administrative infrastructure is affected due to project, there is no loss as per the parameter.				
		Nil				

5	Parameter - 5							
	Environmental losses (Soil erosion, effect of hydrological cycle, wild life habitat, microclimate, upsetting of ecological balance) (To be quantified & expressed in monetary terms)	1) As per thumb rule Environmental losses per Ha of area having density 1.0 occurred over 50 years = 126.74 Lakhs. 2) As the Forest Division wise density of forest varies as below, theEnvironmental losses, Division wise and total Environmental losses will be as under.						
		Sr. No.	Division	Area in Hectare	Forest Density	Average Density	Multiplying Factor*	Loss to Environment (in Lacs)
		1	Rourkela	3.4062	0.6 to 0.8	0.7	126.74	302.19
		2	Sundargarh	1.0948	0.6 to 0.8	0.7	126.74	97.12
		3	Jharsuguda	0.7705	0.2 to 0.6	0.4	126.74	39.06
		4	Bamra WL	14.5667	0.2 to 0.6	0.4	126.74	738.47
		5	Rairakhol	7.2598	0.6 to 0.8	0.7	126.74	644.07
		6	Deogarh	27.5330	0.6 to 1.0	0.8	126.74	2791.62
		7	Angul	10.7726	0.6 to 1.0	0.8	126.74	1092.25
		Total		65.4036		Total		5704.78
6	Parameter - 6	As in the project, no human resettlement & rehabilitation is required there is no loss as per the parameter						
	Suffering to oustees (The social cost of rehabilitation of an oustees in addition to the cost likely to be incurred in providing residence, occupation and social services to him) be worked out as 1.5 times of what he should have earned in two years had he been not shifted.	NIL						

Date: 21.01.2021

M/s GAIL (India) Limited

Place: Bubneshwar

**G. Kandhapani
GM (Construction)**

Annexure No. II

Jagdishpur-Haldia-Bokaro-Dhamra Gas Pipeline Project, Bokaro-Angul (BAPL) Odisha Section Phase-II Evaluation of Benefits

Sr. No.	Parameters	Analysis
1	Parameter - 1	1) The cost of pipeline in Odisha section will be Rs. 221448.94 Lacs. 2) The project IRR is 12.02 % hence the return from pipeline in Odisha for next 50 years will be
	Increase in productivity attributable in the project for 50 years (To be quantified and expressed in monetary terms)	= $221448.94 \times 12.02 \times 50 / 100 = 1330908.13$ Lacs
2	Parameter - 2	It is assumed that there will be over all benefit to economy on account of reduction in LPG price reduction in dependency on fuel wood and reduction in subsidy burden @ 1 % of the total project IRR will be
	Benefits to economy (Value judgment)	1 % of 1330908.13 Lacs = 13309.08 Lacs
3	Parameter - 3	The proposed pipeline 300 Km. covers 5 Districts in Odisha. The cities falling within 50 Km on either side of route will have direct gas supply facility at a reduced cost. This Total 2559441 Families will be benefited at Rs. 1537/- (per year per family)
	No. of population benefited (Value judgment)	Thus the population benefited will be (No. of Families X Net saving per year X 50 = 1966930.41 Lacs <i>(Assuming 100% conversion from LPG to PNG)</i> .
	Benefit to Government (by reduction in subsidy on LPG)	Per cylinder subsidy borne by Government is Rs. 568.00. Assuming 12 cylinders per family is consumed yearly, subsidy burden to the Government is Rs. 6816.00. Thus, benefit to Government over 50 years by conversion of 2559441 families from LPG to PNG is Rs. 8722574.93 Lacs.
4	Parameter - 4	Employment generated during actual laying of pipe line in Odisha will be 0.5 % of the total investment by GAIL of Rs. 1107.24 Lacs in Odisha.
	Employment Potential (Value Judgment)	Thus total Employment generated will be $0.5 \times 1107.24 = 553.62$ Lacs.
5	Parameter - 5	
	Cost of acquisition of facility on non forest land wherever feasible (To be quantified & expressed in monetary terms)	In Odisha 300 Km Gas pipeline is proposed in 65.4036 Ha. of Forest Land & 658.5433 Ha. Of agriculture land. The compensation towards right of use to be paid to agriculture owners. Will be Rs. 243.41 Lacs. Government land 130.8072 Ha. will be used for plantation towards compensatory afforestation. Thus, the amount of plantation in non-

		forest land for compensatory afforestation work out to 150 Lacs (approx.). Total Rs. 393.41 Lacs.
6	Parameter – 6	As the pipeline is underground once the pipeline is laid, the affected agriculture land can be used for agriculture purpose. Thus, loss of agriculture towards land acquire under ROU is NIL Total loss of agriculture land of 130.8072 Ha. used for compensatory afforestation, with annual outturn of agriculture produce at Rs. 5000/- per Ha. per year will be
	Loss of (a) agriculture & (b) Non forest land wherever feasible (Tobe Quantified & expressed in monetary terms)	130.8072 X 5000 X 50 = 327.018 Lacs.
7	Parameter - 7	
	Cost of Rehabilitating the displaced parsons as different from compensatory amounts given for displacement (Tobe Quantified & expressed in monetary terms)	Under this project of Natural Gas pipe line, no human displacement is proposed Thus the cost of rehabilitating the displaced parsons will be NIL
		NIL
8	Parameter - 8	
	Cost of supply of free fuel wood to workers residing in or near forest area during the period of construction.	During actual laying of pipeline & refilling the workes on this project will reside outside forest area & will not require free fuel wood. Thus cost of supply of free fuel wood will be Nil
		NIL

Date: 21.01.2021

Place: Bhubneshwar

M/s GAIL (India) Limited



**G. Kandhapani
GM (Construction)**

गदाधर कन्दपाणी / Gadadhar Kandhapani
महसुब (निर्माण) / General Manager (Const.)
गैस (इंडिया) लिमिटेड / GAIL (India) Limited.
610-612, उदाल सिग्नेचर, पहाला, इनएच-5
610-612, Udal Signature, Pahala, NH-5
भुवनेश्वर-752101, Bhubaneswar-752101

Annexure A

Value of Trees as per girth class wise enumeration of trees for Under FCA 1980 by GAIL (India) Limited Bokaro-Angul (BAPL) Odisha Section Phase-II

Division	0/30	31/60	61/90	91/120	121/150	151 & Above	Total
Rourkela	658	699	157	35	13	12	1574
Sundargarh	313	322	128	34	10	14	821
Jharsuguda	79	58	28	11	3	0	179
Bamra	850	643	390	130	35	36	2084
Rairakhol	288	235	134	39	22	23	741
Deogarh	1013	996	357	132	73	78	2649
Angul	1004	992	230	156	163	23	2568
Grand Total	4205	3945	1424	537	319	186	10616
Form Factor	0.007	0.037	0.094	0.211	0.385	0.542	
Cubic Meter	29.435	145.965	133.856	113.307	122.815	100.812	646.19
Rate Per Tree	205	1083	2750	6173	11264	15858	
Total Value	6034.175	158080.1	368104	699444.11	1383388.2	1598677	4213727.24

Date:

Place:Bhubneshwar

M/s GAIL (India) Limited



G. Kandhapani

GM (Construction)

गदधर कन्दपाणी / Gadadhar Kandhapani
महाप्रबंधक (निर्माण) / General Manager (Const.)
गैल (इंडिया) लिमिटेड / GAIL (India) Limited.
610-612, उज्जल सिग्नेचर, पाहाला, इनएच-5
610-612, Ujjal Signature, Pahala, NH-5
भुवनेश्वर-752101, Bhubaneswar-752101