Annexure –VIII A

COST BENEFIT ANALYSIS OF KARMA STONE MINE PROJECT

While considering a proposal for diversion of forestland for non-forest use, it is essential that ecological & environmental losses and sufferance caused to the people be weighed against economic & social gains.

Guidelines under Forest (Conservation) Act, 1980 para-9 clearly specified vide para – 9.1 of Annexure vi (a) details about the types of cases on which a Cost Benefit Analysis will be required.

In the instant case, the proposal involves forest area more than 2 hectares, including existing road and non-forest activities activities in hilly/undulating tract. Therefore, cost benefit analysis is applicable. The Para graph A is the details of list of parameters, according to which the cost aspect will be determined; while Para B gives the parameter for assessing the benefit accruing.

Vide para 9.2, a cost benefit analysis as mentioned above should accompany the proposal being sent to the central Government for clearance u/s 2 of the F.C. Act – 1980.

A. Basis data for Forest & Environmental Losses: Soil erosion, effect on hydrological cycle, wild life habitat, micro-climatic upsetting of ecological balance etc. are included in this consideration and accounted for. Though technical judgment will have to be primarily applied in determining the losses, but as a thumb rule the environmental value of one hectare of fully stocked forest (Density = 1.0) would be taken as Rs. 126.74 lakhs/hectare to accrue over a period of 50 years. The value will be reduced proportionately with the existing density of crop (vegetation) and the figure of the assumed environmental value will change, if there is increase in bank rate of lending, i.e. the change will be proportionate to the increase in the existing bank rate.

Basic Data for Calculation of Forest & Environmental Loss:

1.	Total area of Forest	14.17 Ha.
2.	Total Broken-up area	Nil (Virgin Forest Land)
3.	Net broken-up area included in modified/revised proposal	Nil
4.	Safety zone area	1.60
5.	Forest area required for proposed mining project (to be diverted from the notified forest land in hectares)	14.17 Ha
B.	Average density	0.01
	Environmental loss 126.74x0.01x14.17	Rs. 17.95 lakhs

B. Parameters for evaluation of BENEFIT not withstanding loss of forest: Quantification & Monetary – Expression, in this case of Karma Stone Mine Project

Sl. No.	Parameters	Sub-Parameters	Quantification & Expression i.e. Benefit in Monetary terms
1.	Increase in productivity attributed to this specific project	----	Production of Stone of 7860300 cu.mt @ Rs 141/- cu mt = 11083 lakh
2.	Benefits to economy	Value judgment of the agricultural field irrigation	Rs. 11083 lakhs basic produce annually
3.	Employment Potential	A) Direct Employment	
		200 employee x 300 days @ 300/- per man days	Rs. 180 lakh per year
		B) Indirect Employment 200 employee x 300 days @ 300/- per man days	Rs. 180 lakh per year
		(Total employment)	Rs. 360 lakh per year
4.	Cost of acquisition of facility on non-forest land wherever feasible	Compensatory Afforestation land has been purchased directly from farmer. The Afforestation Cost for 14.17 Ha 29.99 lakh as per DFO, Garhwa North Forest Division vide letter no 3209 dated 23.08.2016	Total cost = **Rs. 29.99 lakhs**
5.	Loss due to diversion of forest land with respect to:		
	i) Agricultural production	Nil	Nil
	ii) Animal husbandry production	Nil	Nil

6.	No. of persons benefitted (Man days) (Benefits to economy)	Total man days (300 days/yr.) a) Directly = 60000 b) Indirectly = 60000 **Total = 1,20,000**	Total earning per annum Direct = Rs.180 lakhs Indirect= Rs180 lakhs **Total = Rs. 360** lakhs
7.	Cost of rehabilitation of displaced person as different from compensatory amount given for displacement	Not applicable	NIL
8.	Cost of supplying free fuel wood to workers residing in or near the forest area during the period of construction	Not applicable	NIL
		Total benefit	**Rs. 11472.99 lakh** (sum of serial number 8+6+4+2)

Annexure –VIII B

C. Evaluation of Loss of Forest

This para specifies the parameters for evaluating quantum of loss of forest and its stake holders which includes loss of values of timber, firewood & other minor forest produce on an annual basis including loss of man days per annum which derive livelihood & wages from the harvest of the commodities. In the instant case of water reservoir and irrigation project, these are to be quantified and expressed in monetary terms.

Sl. No.	Parameters	Sub-parameters	Losses in Monetary terms
1.	Loss of value of timber, fuel wood and other minor forest produce on an annual basis, including loss of man hours per annum of people who derived livelihood and wages from the harvest of these commodities	Loss of timber and fuel wood as per vide office order no. 40 dated 03.08.1991 of CCF, State, Bihar Total Tree within the Forest Land of 14.17 Ha are 5 nos. Reference to Tree Enumeration list enclosed as Annexure – XVIII)	Total value – 5X0.28Cu.mtXRs127/- = Rs. 177.80 say Rs 200/-
2.	Loss of annual husbandry productivity including loss of fodder	NIL	NIL
3.	Cost of human re-settlement	Land and House Cost	Nil
4.	Loss of public facilities and administrative infrastructure (roads, building, schools, dispensaries, electric lines, railways etc) on forest land which would require forest land if these facilities were diverted due to the project	Nil	Nil
5.	Environmental losses: (soil erosion adverse impact on hydrological cycle, wildlife	i) As a thumb rule environmental value of 1 ha. of fully stocked forest	126.74 x 0.001 x 14.17 Ha. = Rs. 17.95 lakhs

	habitat, microclimate upsetting of ecological balance)	(Density=0.001) would be taken as Rs. 126.74 lakh to accrue over a period of 50 years. ii) In the present case average density of the forest has been assumed to be 0.001 iii) Area proposed to be diverted = 14.17 ha.	
6.	Suffering of oustees	Nil	Nil

Total losses : Rs. 17.95 Lakhs

COST BENEFIT ANALYSIS

(a) Based on value of products (Rs.)

Benefit- Rs11478.42 lakhs
Loss - Rs17.95 lakhs

b) Cost Benefit Ratio

i.e. Benefit = **11472.99** = **639.16 say 640**
Loss **17.95**

Divisional Forest Officer
Hazaribagh West Forest Division
Hazaribagh, Jharkhand

Annexure –VIII C

SUMMARY OF COST BENEFIT ANALYSIS

Total loss per annum due to loss of timber, firewood and minor forest produce and environmental loss due to loss of forest.	17.95 lakh
The total benefit to the economy due to annual production of Iron ore	11472.99 lakh
Hence the cost benefit ratio of the mining project is -	640

Divisional Forest Officer
Hazaribagh West Forest Division
Hazaribagh, Jharkhand