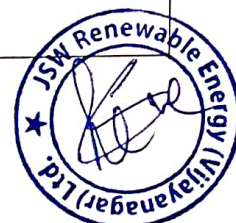


1 : Environment Cost Benefit Ratio

S.N.	Parameters	MoEF Guidelines for CBA of forest land diversion, 2017	Hydro Project	Total loss (Rs lakh)
A	Environmental Cost			
1	Eco-system services losses due to proposed forest diversion	Economic value of loss of eco-system services due to diversion of forests shall be the net present value (NPV) of forest land being diverted	NPV of 23.39 ha forest land (eco-class-IV) to be diverted (i) 23.39×957780 = Rs 224.00 lakh	224.00
2	Loss of animal husbandry productivity including loss of fodder	To be quantified and expressed in monetary terms or 10% of NPV applicable, whichever is maximum	(i) $23.3876 \times \text{Rs } 10000/\text{ha}$ = Rs 23.39 lakh (ii) 10% of Rs 224 lakh = Rs 22.4 lakh. (Max. of two is adopted)	23.39
3	Cost of human resettlement	To be quantified and expressed in monetary terms as per R&R Plan	As per R&R Plan	0.00
4	Loss of Public facilities and administrative infrastructure (Roads, buildings, schools, dispensaries, electric lines, railways, etc.) on forest land, which would require forest land if these facilities were diverted due to the project.	To be quantified and expressed in monetary terms as per actual cost basis at the time of diversion.	No public facilities on forest land are to be diverted	0.00
5	Possession value of forest land diverted	30% of environmental costs (NPV) due to loss of forests or circle rate of adjoining area in the district should be added as a cost component of possession value of forestland, whichever is maximum	30 % of Rs 224 lakh = Rs 67.20 lakh	67.20
6	Cost of sufferings to oustees.	The social cost of rehabilitation of oustees (in addition to the cost likely to be incurred in providing residence, occupation and social services as per R&R plan) be worked out as 1.5 times of what oustees should have earned in two years had he not been shifted.	There shall be no oustees from private land. Therefore, social cost. of rehabilitation of oustees is = 0.00	0.00



7	Habitat fragmentation cost	While the relationship between fragmentation and forest goods and services is complex, for the sake of simplicity the cost due to fragmentation has been pegged at 50% of NPV applicable as a thumb rule.	50% of Rs 224 lakh =Rs 112.00 lakh	112.00
8	Compensatory afforestation & soil moisture conservation cost	The actual cost of Compensatory afforestation & soil moisture conservation and its maintenance in future at the present discounted value	Cost of CA including maintenance cost	351.94
9	Cost of Environmental Management Plan for avoiding, mitigating, checking the adverse impacts on various environmental components during construction and operational phase of the project.	As per cost of EMP included in EIA report avoiding the cost of losses already included in serial No.1 to 8.	Total cost of EMP after discounting cost of Compensatory afforestation plan, cost of human resettlement i.e., R&R plan, relocation cost of public facilities= Rs lakh (2867-351.94) = Rs 2515.03 lakh	2515.03
Total Environment Cost (A)				3293.56
B	Economic Benefits			
1	Increase in productivity attribute to the specific project	To be quantified and expressed in monetary terms avoiding double counting	Benefit cost from net annual energy from PSP @ difference of levelized tariff Rs 8.67/unit at Rs3.0/unit pumping cost and the pumping cost of Rs 3.0/unit =465.2 GWh x Rs 5.67/unit (8.67-3.00) = Rs26376.84lakh	26376.84
2	Number of Populations benefit due to specific project	As per DPR	The project will directly benefit the population of the country as a whole and the state in particular, due to enabling Karnataka Govt., to harness much more renewable energy (Solar and Wind)	0.00
3	Economic benefits due to direct and indirect	As per DPR	(i) During peak stage of construction, employment will be	382.98



	employment due to the project.		<p>generated for 650 skilled/semi-skilled/unskilled labour. Assuming that on an average 500 persons are employed with an average minimum wage of Rs 9383/-pm after discounting the income of Rs 3000/pm by the person being earned before being engaged in construction, the net benefit shall be =Rs $6383 \times 12 \times 500 =$ Rs382.982lakh.</p> <p>(ii) After completion during operation about 25 people will get employment for O&M, routine upkeep / maintenance of roads and buildings. Average benefit shall be $25 \times 12 \times 25000 =$ Rs75 lakh</p>	75.00
4	Economic benefits due to compensatory afforestation	Benefits from such compensatory afforestation accruing over next 50 years monetized and discounted to the present value should be included as benefits of compensatory forestation. For benefits of CA the guidelines of the Ministry for NPV estimation may be consulted	Compensatory afforestation in 23.65 ha @ discount rates of 2% /yr of NPV $= 0.02 \times 12.28 \times 23.65$ = Rs 5.80lakh	5.80
Total Environment Benefits (B)				26840.62
Total benefits due for useful life of 40-year = $40 \times (26376.84 + 75 + 5.80) + 382.98$				1058688.58
Environment Benefit Cost Ratio = $1058906.78 / 3293.56$				321.44:1

