


CHECK LIST NO. - 33


COST BENEFIT ANALYSIS OF PROJECT

(Ref: MoEF guideline No. 7-69/2011-FC (Pt.) dated 01st Aug, 2017)

Table A: Cases under which a cost-benefit analysis for forest diversion are required

Sr. No.	Nature of Proposal	Applicable/ not applicable	Remarks
1.	All categories of proposals involving forest land up to 20 hectares in plains and up to 5 hectares in hills.	Not Applicable	
2.	Proposal for defense installation purposes and oil prospecting (prospecting only)	Not Applicable	
3	Habitation, establishment of industrial units, tourist lodges/ complex and other building construction	Not Applicable	
4	All other proposals involving forest land more than 20 hectares in plains and more than 5 ha in hills including roads, transmission lines, minor, medium and major irrigation projects, hydro projects, mining activity, railway lines, location specific installations like micro-wave stations, auto repeater centers, T.V towers etc.	Applicable	This is 16.50 MW Hydro Electric Project being constructed in the hilly area of Distt. Chamba (HP) for which barest minimum 11.9813 Hect. Forest land for various component of the project has been identified for diversion. Meticulous exercise has been carried out to minimize the use of forest land and trees (which has been accepted after the site inspection by the forest officers of the area) and keeping the public interest intact.


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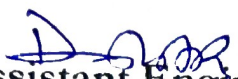

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Table B: Estimation of cost of forest diversion

Sr. No.	Parameters	Remarks	Monetary Equivalent
1.	Ecosystem services losses due to proposed forest diversion.	Economic value of loss of ecosystem service due to diversion of forest shall be the net present value (NPV) of the forest being diverted as prescribed by the Central Government (MoEF& CC.) Note: In case of National parks the NPV shall be ten (10) times the normal NPV or otherwise prescribe NPV by the ministry or any other competent authority.	There will be no loss to hydrological cycle, wild life habitat or micro climate. However, economic value of loss of ecosystem services shall be the net present value (NPV) of the forest land being diverted which is ₹ 83.74 lakh.
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.	Winters are very severe and prolonged so people do keep minimum number of cattle. Local requirement for fodder is generally met from their own agricultural fields and grazing pastures. In fact, majority people do keep sheep goats and other small animals. Sufficient forest land is available to meet out the requirements. However, amount 10% of NPV which is ₹ 8.37 lakh has been considered as loss for animal husbandry productivity including loss of fodder.
3	Cost of human resettlement.	To be quantified and expressed in monetary terms as per approved R & R plan.	There is no human resettlement in the proposal.
4	Loss of public facilities and Administrative infrastructure (Roads, buildings, schools, dispensaries,	To be quantified and expressed in monetary terms on actual cost basis at the time of diversion.	There will be no loss of public facilities and Administrative Infrastructure (roads, buildings, schools, dispensaries, electric lines, railway etc.) on forest land.

	electric lines, railway etc) on forest land, which would require forest land if these facilities were diverted due to the project.		However, if any such case arises, it will be quantified and expressed in monetary terms on actual cost basis.
5	Possession value of forest land diverted	30% of environmental cost (NPV) due to loss of forests or circle rate of adjoining area in the district should be added as a cost component as possession value of forest land whichever is maximum.	30% of environmental costs (NPV) due to loss of forests which is equal to ₹ 25.12 lakh. In case of Hydroelectric projects possession of diverted forest land is not completely required by the user Agency after completion of the project during operation and maintenance (O & M) stage. As per existing MoEF guideline areas diverted for temporary use viz. dumping sites, job facility areas and their approach roads will be handed over to forest department.
6	Cost of Suffering 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.	Not applicable for this project since no resettlement is involved as there is no outsee being evicted.
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.	Cost due to Fragmentation has been pegged at 50% of NPV which is equal to ₹ 41.87 lakh.

8	Compensatory afforestation and soil and moisture conservation cost.	The actual cost of compensatory afforestation and soil & moisture conservation and its maintenance in future at present discounted value.	The actual cost of compensatory afforestation and soil & moisture conservation and its maintenance in future worked out by forest department is ₹ 27.59 lakh.
	Total in lakh	$83.74+8.37+25.12+41.87+27.59 = ₹ 186.69 \text{ lakhs}$	


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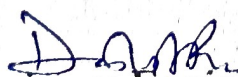


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Table C: Existing guidelines for estimating benefits of forest diversion in CBA

Sr. No.	Parameters	Remarks	Monetary Equivalent.						
1.	Increase in productivity attributable to the specific project.	To be quantified & expressed in monetary terms avoiding double counting.	<p>The Sai-Kothi -II hydro electric project (16.5MW) will generate the electricity free from any type of environmental pollution. Construction of project roads will provide connectivity to Shali, Rawans, Kardew and Buin village which reduces labour and transportation cost thus easily and economic transportation of local produce to market. Access to local scenic sites will increase the productivity in field of tourism. Familiarization with flora and fauna of local places.</p> <p>The project area being at a remote point in the grid, the development of the site is expected to lead in stabilization and improvement of the grid. The power generated from the project will help in mitigating the power shortage in the Northern Grid.</p> <p>Electric energy has a vital and significant role to play in the economy of any state. In fact requirement of power and its availability has been recognized as the surest index of a country's overall economic growth, as it is one of the basic inputs for industrial as well as agricultural development. Uninterrupted supply of electricity can make a big difference in society. It boosts socio economic growth, irrigation, telecommunication facilities, health, education and overall economy of state.</p> <p>The hydropower project is renewable, environment friendly and CO₂ emissions free in comparison to thermal power plants. No submergence is involved for this project. Catchment area treatment will contribute to mitigate catchment soil erosion. There will be no loss of the agricultural and animal husbandry production as sufficient forest land is available nearby.</p> <p>The monetary equivalent of above benefits cannot be worked out.</p>						
2.	Benefits to Economy	The incremental economic benefit in monetary terms due to the	<p>Revenue generated from the project for 40 years</p> <table><tr><td>I.</td><td>Capacity of the project.</td><td>16.5 MW</td></tr><tr><td>II.</td><td>Power Tariff for supply</td><td>₹ 3.22 per unit.</td></tr></table>	I.	Capacity of the project.	16.5 MW	II.	Power Tariff for supply	₹ 3.22 per unit.
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		specific project.	<div> <div>of Power House bus bars has been assumed (Avg. Total for 40 years).'</div> <div> <div>III. Unit sold per year.</div> <div>74.66 million units</div> </div> <div> <div>IV. Revenue has been assessed accordingly for 75 % dependable year.</div> <div>₹ 24.04 Cr/ year</div> </div> <div> <div>V. Total revenue generated for 40 years.</div> <div>₹ 96160 lakhs</div> </div> </div> <p>Considering maintenance, bear & tear and other losses monetary equivalent of above benefits considered as 50% of ₹ 96160 lakhs = ₹ 48080 lakh.</p>
3	Nos. of Population benefited	As per the detailed project report.	About to 2875 number of peoples of villages Juthar, Shalli, Naghai, Salwin, Dori, Buin and Khakri will be benefited by the construction of this project.
4	Economic benefits due to of direct and indirect employment.	As per the detailed project report.	On average approximately 175 numbers of persons from affected population to be employed directly/ indirectly and approximately 250000 m-days of temporary employment will be generated during construction of the project for 4 years. Monetary equivalent of above benefits considered as ₹ 750 lakh.
5	Economic benefits due to Compensatory afforestation.		The Compensatory Afforestation will be done in 24 hectare (twice the area of Forest diversion) of undemarcated protected forest land, which is down the line would be having a density of minimum 0.8. The ecological value for a 50 years period of density of 1.0 is ₹ 126.74 lakh per hectare (As per Forest Conservation Act 1980). By considering minimum 0.8 density, the ecological gain for this project would be $126.74 \times 0.8 \times 24$ equal to ₹ 2433.40 lakh. Monetary equivalent considered as ₹ 2433.40 lakh.
Total benefits of the project (monetary equivalent)			$48080 + 750 + 2433.40 = ₹ 51263.40$ lakh


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Summary of cost benefit ratio

Total benefit to society

= ₹ 51263.40 lakh

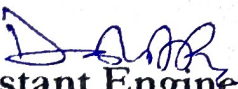
Total environmental loss


= ₹ 186.69 lakh

Cost Benefit Analysis Ratio (CBA Ratio) = Benefit/Loss = 51263.40 / 186.69

= 274.59 : 1

The cost benefit ratio is equal 274.59 : 1. Which is greater than one, so project is found valuable based on given/ above described criteria.


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