

## Cost-Benefit Analysis for projects involving forest diversion

**Table-A: Cases under which Cost-Benefit Analysis for forest diversion is required**

S. No.	Nature of proposal	Applicable/ not applicable	Remarks
1	All categories of proposals involving forestland upto 20 hectares in plains and upto 5 hectare in hills.	Not applicable	These proposals may be considered on a case-to-case basis and value judgment.
2	Proposal for defense installation purposes and oil prospecting (prospecting only).	Not applicable	In view of national Priority accorded to these sectors, the proposals would be critically assessed to help ascertain that the utmost minimum forest land is diverted for non-forest use.
3	Habitation, establishment of industrial units, tourist lodges complex and other building construction.	Not applicable	These activities being detrimental to protection and conservation of forest, as a matter of policy, such proposals would be rarely entertained.
4	All other proposals involving forestland morethan 20 hectares in plains and more than 5 hectares 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, TV towers etc.	Applicable	These are cases where a cost-benefit analysis is necessary to determine when diverting the forestland to non-forest use in the overall public interest.

  
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**Table-B: Estimation of cost of forest diversion**

S. No.	Parameters	Details	Amount (Rs In Lakhs)
1	Ecosystem services losses due to proposed forest diversion.	Economic services loss due to proposed Diversion of Forest land determined by State Forest Department as a Net Present Value (NPV)	3449.22
2	Loss of animal husbandry productivity, including loss of fodder.	10% of NPV applicable as a thumb rule.	34.49
3	Cost of human resettlement.	Cost of Human Resettlement (R&R Plan of EMP)	22000.00
4	Loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways, etc.) on forestland, which would require forest land if these facilities were diverted due to the project.	Cost of relocation/realignment of infrastructures due to loss of public facilities (As per DPR) <ul style="list-style-type: none"> <li>• Realignment of road -1.84 Km (Ramban-Gul road) 6500.00</li> <li>• Realignment of Dhamkund-Gul road 12000.00</li> <li>• Construction of new bridges near Ramban 5000.00</li> <li>• Irrigation (Haroog Khul) 50.00</li> <li>• PHE 175.00</li> <li>• Realignment of power infrastructure 5000.00</li> </ul> <b>28725.00</b>	
5	Possession value of forest land diverted.	30% of NPV applicable as a thumb rule	1034.77
6	Cost of suffering to oustees.	Total nos. of PAFs = 1477 Tentative earning of outstee if they have not shifted = $1477 \times 70176 \times 2$ = Rs. 2073 lakh (Assuming per capita income of J&K = Rs. 70176) Cost of Suffering = Rs. 2073 * 1.5 = <b>Rs. 3110 lakh</b>	3110.00
7	Habitat Fragmentation Cost.	50% of NPV applicable as a thumb rule	1724.61
8	Compensatory Afforestation and soil & moisture conservation cost.	Cost of Compensatory afforestation (as per EMP)	541.15
	<b>Total Cost</b>		<b>60619.24</b>

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**Table-C–Existing guidelines for estimating benefits of forest-diversion in CBA**

S. No.	Parameters	Remarks	Amount (Rs. In Lakhs)
1	Increase in productively attribute to the specific project.	<p>Net design energy (Annual) as per DPR = 7994.73 MUs</p> <p>Cost of saleable net design energy = 6871.95MUs*Rs.5.06/kWh (levelised tariff)</p> <p>6871.95*0.87*5.06/kwh = Rs.302518.30 lakh</p> <p>Assuming O&amp;M life as 35 years = Rs. 302518.30 lakh *35 = <b>Rs.10588140.6246 lakh</b></p>	<b>10588140.62</b>
2	Benefits to economy due to the specific project.	<p><b>Benefits to the State Economy</b></p> <p>The estimated cost of the Project is Rs.20317crores (Feb.2016 PL) and all necessary finances for the implementation of the project through loans, debentures, its own income from previous projects or such other sources. As per the Memorandum of Understanding (MoU), UT of J&amp;K will get 12% free (6871.95*0.12=824.63 MUs) Power = 824.63*5.06/kwh*35year = <b>Rs.1460419.73 Lakh</b></p>	<b>1460419.73</b>
3	No. of population benefited due to specific project.	<p><b>Benefits to the Local Economy</b></p> <p>NHPC Limited shall contribute 1% to the Local Area Development Fund (1/12 of point 2) = 1460419.73/12 = <b>Rs.121701.64Lakh</b></p> <p>NHPC Limited shall be liable to provide an equivalent amount of 100 units of electricity per month for 10 years as per applicable with respect to Local Area Development of the Districts. In addition to this, NHPC Limited shall also run Community Development Scheme and Corporate Social Responsibility programmes for the villages within / around the Project site, for the purpose of Local Area Development including capacity / skill development of affected population, as per the objectives and policies.</p> <p>As per census 2011, about 11,53,365 populations shall be benefited in Reasi (314667), Udhampur (554985) and Ramban (283713) – (EIA)</p>	<b>121701.64</b>

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4	Economic benefits due to direct and indirect employment due to the project.	<p><b>A. Direct Employment</b> (As per Dugar HEP and EIA of Sawalkot HEP)</p> <p>1. <b>Pre-construction Period (2 years)</b> Total man-days required = 2500 nos. Cost = <math>2500 \times 400 \times 25 \times 12 \times 2</math> = Rs.6000.00 lakh</p> <p>2. <b>Construction Period (8 years)</b> Total man-days required = 6500 nos. Cost = <math>6500 \times 400 \times 25 \times 12 \times 8</math> = Rs.62400.00 lakh</p> <p>3. <b>O&amp;M Period (35 years)</b> Total man-days required = 200 nos. Cost = <math>200 \times 600 \times 25 \times 12 \times 35</math> = Rs.12600.00 lakh Total = <math>6000 + 62400 + 12600</math> = <b>Rs. 81000.00 Lakhs</b></p> <p><b>B. Indirect Employment</b> (As per Dugar HEP and EIA of Sawalkot HEP) Indirect Employment to locals in terms of the Support business to satisfy the needs of manpower deployed in the project during various stages of constructions and Operation and Maintenance periods.</p> <p>1. <b>Pre-construction Period (2 years)</b> Total man-days required = 2500 nos. Cost = <math>2500 \times 4000 \times 12 \times 2</math> = 2400.00 lakh</p> <p>2. <b>Construction Period (8 years)</b> Total man-days required = 6500 nos. Cost = <math>6500 \times 4000 \times 12 \times 8</math> = 24960.00 lakh</p> <p>3. <b>O&amp;M Period (35 years)</b> Total man-days required = 200 nos. Cost = <math>200 \times 4000 \times 12 \times 35</math> = 3360.00 lakh Total = <math>2400 + 24960 + 3360</math> = Rs. 30720.00 Lakhs</p> <p><b>Total benefits (Direct and Indirect)</b> = <math>81000 + 30720</math> = <b>Rs. 11,17,20.00 lakh</b></p>	111720.00
5	Economic benefits due to Compensatory Afforestation.	The total forest land required to be diverted is <b>684.15 ha</b> . Out of which <b>143 ha</b> is required for underground structures of the project. Hence, the Compensatory Afforestation will be done on double the degraded area of the diverted ground forest land i.e. $541.15 \times 2 = 1082.30$ ha. The total cost is 541.15 lakh as per EMP	

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		<p>and where about 8.68 lakh plants will be planted (about @1600 plants/ha). Survival Rate 80% = 6.94 lakh plants. Due to this plantation not only the micro climate will enhance but also the biodiversity of the area.</p> <p>Economic benefits due to Forest Cover of CA</p> <p>= 177000 Rs./ha</p> <p>= 1082.30 ha *177000</p> <p>= <b>Rs. 1995.67 lakh*</b></p> <p>1995.67</p> <p>*For benefits of CA the guideline of the Ministry for NPV estimation may be consulted</p>	
	<b>Total benefit</b>		<b>12,28,39,77.66</b>

**Project Benefits : Rs. 12283977.66 lakh**

**Project Cost : Rs. 60619.24 lakh**

**Cost Benefit Ratio: (12283977.66 / 60619.24) : 202.64**

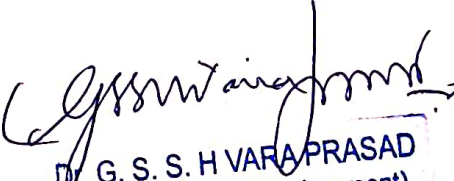
  
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