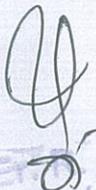
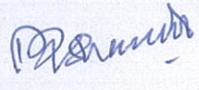


## Cost Benefit Analysis Guidelines for forest land diversion -2017

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

No	Nature of proposal	Applicable/ not applicable	Remarks
1	All categories of proposals involving forest land 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 judgement
2	Proposal for defence 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 more than 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 centres, TV towers etc.	Applicable	These are cases where a cost-benefit analysis is necessary to determine when diverting the forest land to non-forest use in the overall public interest.

  
  
  
**E. L. Negi**  
 Head of Project  
 SJVN, LHEP, Bithal

## Cost Benefit Analysis for diversion of forest land

**Table –B: Estimation of cost of forest diversion.**

Sr. No.	Parameters	MoEF Guidelines	HYDEL PROJECT	Total Loss (Rs. in Lakhs)
1	Ecosystem 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 the forest land being diverted.	Total Forest Land (class-VI) proposed for diversion= <b>98.1004 ha.</b> NPV Rates to open forest of class-VI @ 6,99,000/- ha.	685.722
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.	Total Forest Land (class-VI) proposed for diversion= <b>98.1004</b> i)Economic value of fodder production/Rs. In lakhs/year= <b>98.1004x4514=4.428 Lakhs</b> ii)NPV Rates to open forest of class-VI @ 6,99,000/- ha. = <b>685.7218 Lacs @ 10%</b>	68.572
3	Cost of human resettlement.	To be quantified and expressed in monetary terms as per approved R&R plan.	As per Draft Final EMP Report for LHEP stage-I (P-11.6-7)= <b>1096.60 Lakhs</b>	1096.60
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.	To be quantified and expressed in monetary terms on actual cost basis at the time of diversion.	Land required for diversion of NH-22 is already being included and there is no loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways, etc.) on forest land.	-----
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 as possession value of forestland whichever is maximum.	Total Forest Land (class-VI) proposed for diversion= <b>98.1004 ha.</b> NPV Rates to open forest of class-VI @ 6,99,000/- ha.= <b>685.7218 Lacs @ 30%</b>	205.717
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.	Houseless PAFs as per R&R Plan=10. Social cost of rehabilitation of oustees= 10Nos. @ Rs.210/- (minimum Wages)x 30x 24months X 1.5 times = <b>10x6300x24x 1.5=22,68,000/-</b>	22.680
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.	Total Forest Land (class-VI) proposed for diversion= <b>98.1004 ha.</b> NPV Rates to open forest of class-VI @ 6,99,000/- ha. <b>98.1004x 699000.00x 50%</b>	342.861
8	Compensatory afforestation and soil & moisture conservation cost	The actual cost of compensatory afforestation and soil & moisture conservation and its maintenance in future at present discounted value.	Cost of Compensatory afforestation as per Draft Final EMP Report for LHEP stage-I, P-4.4 = <b>552.92 Lakhs</b>	552.92
			<b>Grand Total</b>	<b>2975.072 Lakhs</b>

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

Sr. No.	Parameters	MoEF Guidelines	HYDEL PROJECT	Total Benefits (Rs. in Lakhs)
1	Increase in productively attribute to the specific project	To be quantified & expressed in monetary terms avoiding double counting	Net design energy(Annual) =535.82 GWh (Main Plant)+ 222.38 GWh(Aux. Plant)= <b>758.20 GWH</b> Cost of saleable net design energy @5.66 /kWh (Levelised tariff)=429.1412 crores.	42914.12
2	Benefits to economy due to the specific project.	The incremental economic benefit in monetary terms due to the activities attributed to the specific project	<ol style="list-style-type: none"> <li>1. One of the most important requirements for the overall development of a State and Nation is power/energy. Since, Hydel power is the cleanest, cheapest and environmental friendly source of energy; it is the top priority of the State and Nation. The energy obtained from the project will meet up the present shortage of State/ National grid. Development of the project will facilitate the emergence of industries, trade and commerce and would thereby bring more and more economic improvement.</li> <li>2. Direct benefit to the state (13% free power) for a 90% dependable year with 95% machine efficiency, the project will generate annual revenue from sale of 13% of the production.</li> <li>3. The overall improvement of the infrastructure like roads, eco-tourism, communication etc. would boost up the economy of the State and the living standard of the people will go up.</li> <li>4. Adding more employment opportunities and giving boost to economic growth.</li> <li>5. The project involved an investment of 2208.34 Cr. at completion cost. This will directly benefit the entire Indian GDP. So Annual Benefit for first five years= <math>2208.34/5 = 441.668</math> crores/year. <b>This benefit has not been taken into account.</b></li> </ol> <p>However, Increase in economy due to more industrialization and agriculture production (assumed as 100% the cost of saleable design energy)= <math>42914.12 \times 100\% = 42914.12</math> Lakhs.</p>	42914.12
3	No. of population benefited due to specific project	As per the Detailed project report	The completion of the project will directly benefit the population residing in Project affected Panchayats (as per Draft Final EMP Report for LHEP stage-I, P-11.3, the total population of the affected villages is <b>6095</b> belonging to 1468 households (Census, 2011) as well as the entire population of the State ( <b>12% free power</b> ) and rest of India through sale of electricity. <b>Increase in net benefit not valued.</b>	-----
4	Economic benefits due to of direct and indirect employment due to the project	As per the Detailed project report.	During the peak construction stage employment will be generated for about <b>7450 skilled and unskilled</b> manpower (as per Draft Final EMP Report for LHEP stage-I, P-7.2). After the completion of the project, about <b>200</b> people are likely to be employed in various categories for Operation, maintenance and security	

  
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			of the HEP & for the routine upkeep and maintenance of the roads & Buildings etc. <b>Assuming 200 people get employment after completion of project, So Average Benefits=200x40000 (Av./month)x12=960 Lakhs</b>	960.00
5	Economic benefits due to Compensatory afforestation	Benefits from such compensatory forestation accruing over next 50 years monetised and discounted to the present value should be included as benefits of compensatory afforestation. *For benefits of CA the guideline of the Ministry for NPV estimation may be consulted.	Estimated cost for Compensatory afforestation & biodiversity Management Plan (as per Draft Final EMP Report for LHEP stage-I, P-4.12) = 1486.74 Lakhs	1486.74
			<b>Grand Total (Annual Benefits)</b>	<b>88274.98 Lakhs</b>
<b>Assuming Project Life as 50 Years, Hence Benefits for 50 Years= 88274.98x50</b>				<b>4413749.00 Lakhs</b>

(C) Benefit/Cost Ratio

<b>Total Benefit</b>	4413749.00 Lakhs
<b>Total Cost</b>	2975.072 Lakhs
<b>Benefit cost ratio</b>	<b>1483.577</b>

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**E. L. Negi**  
 Head of Project  
 SJVN, LHEP, Bithal

**CALCULATION OF NET PRESENT VALUE OF FOREST LAND TO BE DIVERTED  
UNDER FCA FOR CONSTRUCTION OF LUHRI HYDRO ELECTRIC PROJECT  
(775 MW)**

1.	Area proposed for diversion.	38-24-50
2.	Name of area proposed for diversion	UF-Bhadraash UF-Behra & Machada
3.	No. of trees coming in the forest land including sapling	301+340 = 641
4.	ECO-Value Class	Class-VI, open Forest
5.	NPV rate applicable to open forest of class VI	Rs. 6,99,000/- per ha.
6.	Total Net Present Value	6,99,000 x 38.2450 = Rs. 2,67,33,255
	<b>Total</b>	<b>2,67,33,255/-</b>

**Note:-**

If any recovery is pointed out by the audit or higher authority will be effected in lump-sum from the user agency.

*Atcham 2.11.13*  
Divisional Forest Officer,  
Rampur Forest Division,  
Rampur Bushahr.  
Office Seal \_\_\_\_\_

*Shiv*  
*Prasanna*  
*OP*  
Er. B. L. Negi  
Head of Project  
SJVN. LHEP. Bithal

Bill of Net Present Value in lieu of diversion of forest land proposed to be diverted for construction of of Luhri Hydro Electric Project in Ani Forest Division, District Kullu, H.P.

687

C.P-109

Annex-A2

Area proposed for diversion	84.71.78 hac.i/d underground works
Name of area proposed for diversion	Different places in Nither Range
No. of trees coming in proposed forestland	1049 including saplings.
Type of Forest	Dry temperate/open forest
ECO-Value/class of forest	Class-VI
NPV rates applicable to very dense forest of class-I	35.58.15X991000=3,52,61,266/-only
NPV rates applicable to open forest of class-VI	49.13.63X699000=3,43,46,274/-only
	84.71.78 hac. =6,96,07,540/-only
Total: -	Rs. 6,96,07,540/-only
Or say	Rs. 6,96,07,540/-only only

(Rs. Six Crore, Ninety six Lac, Seven thousand Five hundred & Forty) only

On Divisional Forest Officer  
Ani Forest Division, Lahli

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*[Handwritten Signature]*  
E. S. L. Negi  
Head of Project  
SJVN, LHEP, Bithal

CD-108

Annex-A3  
196

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**BILL OF NPV**

**CALCULATION OF NET PRESENT VALUE OF FOREST LAND TO BE DIVERTED UNDER FCA FOR CONSTRUCTION OF LUHRI HYDRO ELECTRIC PROJECT.**

1.	Area proposed for diversion.	7-00-59 ha.
2.-	Name of area proposed for diversion	UPF- Naula UPF- Rewalli UPF - Kirti UPF - Kepu UPF - Urshu UPF- Talaha
3.	No. of trees coming in the forest land including sapling	223+91=314 trees (160 Sapplings)
4.	ECO- Value Class	Class-VI- Open forest
5.	NPV rate applicable to open forest of class VI	Rs. 699000/- per ha.
6.	Total Net Present Value	699000 x 7-00-59= 4893629/-

**Note:-**

If any recovery is pointed out by the audit or higher authority will be affected in lump-sum from the user agency without any prior notice.

Date: 31-3-2009  
Place: Kotgarh

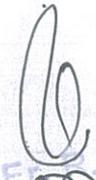
  
(B.L. Negi, IFS)  
Divisional Forest Office  
~~Divisional Forest Office~~ Kotgarh  
Kotgarh (H.P.)

Acknowledge by

Date:  
Place: Kotgarh

  
Signature of User Agency  
Office Seal.....

(S. K. SHARMA)  
By General Manager (C)  
R&R/Land Acquisition Dept.  
Luhri Hydro-Electric Project (Sainj)

  
B.L. Negi  
Head of Project  
SJVN, LHEP, Bithal

