

Cost Benefit Analysis for

**BHAM MEDIUM IRRIGATION PROJECT**

On the basis of Guidelines for forest land diversion 2017

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

No.	Nature of proposal	Applicable / Not applicable	Remark
1	All categories of proposal involving forest land up to 20 hectares in plains and up to 5 hectares in hills.	Not applicable	
2	Proposal for defence 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 plain and more than 5 hectares in hills including roads, transmission lines, minor, medium and major irrigation project, hydro projects, mining activity, railway lines, location specific installations like micro-wave station, auto repeater centers, 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 of overall public interest. The Bham Medium Irrigation Project falls under this category.

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

S.No.	Parameters	Remark
1.	Ecosystem services losses due to proposed forest diversion.	Ecosystem services due to diversion of forest land suggested by the Central Powered Committee as per the forest classification report of proposed Bham Medium Irrigation Project is ₹ 6.26 Lakhs / Ha. Cost of land = 101.00 x 6.26 = ₹ 632.26 Lakhs
2.	Loss of animal husbandry productivity including cost of fodder.	As per the cost benefit guideline i.e. 10% of N.P.V. 0.626 Lakh per Ha. = 101.00 x 0.626 = ₹ 63.23 Lakhs
3.	Cost of human resettlement	There is no human settlement due to proposed Bham Medium Irrigation Project. hence cost of Human resettlement is Nil.
4.	Loss of public facilities and administrative infrastructure (Road, building, schools, dispensaries, electric lines, railways etc.) on forest land if these facilities were diverted due to the project.	There is no loss of public facilities and administrative infrastructures of forest land due to construction of Bham Medium Irrigation Project. no cost has been added on this account.
5.	Possession value of forest land diverted.	The possession value of forest land diverted is taken 30% of the N.P.V. due to loss of forest i.e. ₹ 1.878 Lakhs / Ha. = 101.00 x 1.878 = ₹ 189.68 Lakhs
6.	Cost of suffering to oustees	Not applicable.
7.	Habitat fragmentation cost.	Forest land is being acquired for submergence of Bham Medium Irrigation Project. There is no amount is taken under this account.
8.	Compensatory afforestation and soil and moisture conservation cost.	The cost @ ₹ 4.00 Lakhs per Ha. is taken for compensatory afforestation and soil moisture conservation. Hence amount will be : = 101.00 x 4.00 = ₹ 404.00 Lakhs
9.	Total cost due to forest land diversion	Total cost due to forest land diversion for Bham Medium Irrigation Project will be : = 632.26 + 63.23 + 189.68 + 404.00 = ₹ 1289.17 Lakhs

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

S.No.	Parameters	Remark
1.	Increase in productivity attribute to the specific project.	The crop production benefit due to Bham Medium Irrigation Project will be ₹ 5394.20 Lakhs in designed life of 100 years and water level will be increase economy growth of the project. Project also reserves the water for Drinking purpose for adjacent villages.
2.	Benefits to economy due to the specific project.	Bham Medium Irrigation Project will trigger economy development and also influence with irrigation facility to a land of 6100 Ha. in the surrounding area. Irrigation is proposed by pressurized pope system.
3.	No. of population benefited due to specific project.	Project is located in backward area of the village. After completion of project. 4849. Cultivators will be benefitted and water level will be increased in surrounding area. This project will also facilitate drinking water supply to adjacent villages.
4.	Economic benefits due to of direct and indirect employment due to the project.	The project will be provided direct employment for approximate 13000 people (24 month) during construction period.
5.	Economic benefits due to compensatory affrestation.	An economic benefit due to compensatory afforestation has considered as per the benefit of C.A. guidelines of ministry for N.P.V. estimation.

  
Sub Divisional Officer  
Sukta H/W Sub Division  
No.6, Borgaon

  
(S.M. Chaturvedi)  
Executive Engineer  
Water Resources Division  
Khandwa

**BHAM MEDIUM IRRIGATION PROJECT**

**COST BENEFIT ANALYSIS**

Total cost due to forest land - ₹ 1289.17 Lakhs

Total benefit due to project - ₹ 5394.20 Lakhs

Benefit ratio of project - 1.67

  
 (P.K. Brahmne)  
 Sub Divisional Officer  
 Sukta H/W Sub Dn. No. 6  
 Borgaon

  
 (S.M. Chaturvedi)  
 Executive Engineer  
 Water Resources Division  
 Khandwa

**BAM MEDIUM IRRIGATION PROJECT**

Tehsil : Khandwa

District : Khandwa

**PROFORMA FOR THE CALCULATION OF BENEFIT COST RATIO**

S.No.		Before Irrigation (Without project)	After Irrigation (With project)
1	Grass value of farm produce	276.29	7024.00
2	Dung receipts (at 30% of the fodder expenditure)	12.43	210.72
3	Total (A) Gross receipts (1+2)	288.72	7234.72
<b>B</b>	<b>EXPENSES</b>		
B1	Expenditure on Seeds		326.00
B2	Expenditure on manure etc.		446.00
B3	Expenditure on hired labour (human and	175.60	965.40
B4	Foder expenses (as percentage of gross) 15% before irrigation and 10% after irrigation		
B8	<b>Total Expenses</b>	175.60	1737.40
<b>C</b>	<b>NET VALUE OF PRODUCT</b>		
1	Total Gross receipts (Total A.3)	288.72	7234.72
2	Minus Total expenses (Total B.8)	-175.60	-1737.40
3	Net value of product C : (1-2)	113.12	5497.32
<b>D</b>	<b>ANNUAL AGRICULTURAL BENEFITS</b>		
1	Net value after irrigation (C.3)		5497.32
2	Net value before irrigation (C.3)		113.12
3	Net Annual Benefits C : (1-2)		5384.20
<b>F</b>	<b>TOTAL NET ANNUAL BENEFITS (D3+E)</b>		
<b>G</b>	<b>ANNUAL COSTS</b>	<b>10%</b>	<b>5%</b>
1	Interest on capital @ 10% and 5% (Estimated total cost of the project including cost of land development)	2281.17	1140.58
2	Depreciation of the project @ 2% for 50 years life of the project deduct cost of pumps and rising main	413.24	413.24
3	Annual operation and maintenance charges @ ₹ 180 per Ha. of CCA 6100 Ha.	10.98	10.98
4	Maintence of head work @ 1% of total cost	228.12	228.12
5	Depreciation of the pumping system 1/15 per annum as per CPHEED @ 6.66% of the esimated cost of the pumping system and solar cells system assuming life of the system as 15 years (Applicable to lift irrigation)	54.09	54.09
6	Depreciation of the raising mains @ 3.33% of the estimated cost of the raising mains assuming life of the system as 30 years (Applicable to lift irrigation)	36.09	36.09
7	Power charges for lift irrigation @ of 1800 HP x 120 x 16 x 6.00	207.36	207.36
	<b>Total</b>	<b>3231.05</b>	<b>2090.46</b>
	<b>B.C. Ratio</b>	<b>1.67</b>	<b>2.58</b>

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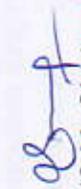
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**EXISTING CROP PATTERN AND PRODUCTIVITY BEFORE IRRIGATION -6100 ha (Net CCA)**

S. NO.	Crop	%	Area (Ha)	Yield/ Ha (Kg/Ha)	Total Yield (Qtl)	Price (Rs/ Qtl)	Total Income (Rs. in Lakhs)	Expenditure (Rs/ Ha)	Total Expenditure (Rs. in Lakhs)	Net Income (Rs. in Lakhs)
<b>Kharrif</b>										
1	Jowar	0.10	6.10	1000.00	61.00	1750.00	1.07	12000.00	0.73	0.34
2	Maize	0.05	3.05	2500.00	76.25	1100.00	0.84	8300.00	0.25	0.59
3	Cotten	1.00	61.00	800.00	488.00	4000.00	19.52	19000.00	11.59	7.93
4	Paddy	0.05	3.05	1800.00	54.90	1000.00	0.55	17000.00	0.52	0.03
5	Tur	0.10	6.10	500.00	30.50	5000.00	1.53	15500.00	0.95	0.58
6	Others	0.50	30.50	700.00	213.50	1200.00	2.56	6300.00	1.92	0.64
7	Urad	0.05	3.05	1200.00	36.60	4500.00	1.65	10200.00	0.31	1.34
8	Soyabean	10.50	640.50	1000.00	6405.00	3000.00	192.15	19500.00	124.90	67.25
					<b>Total</b>		<b>219.87</b>	<b>107800.00</b>	<b>141.17</b>	<b>78.70</b>
<b>Rabi</b>										
1	Wheat	3.00	183.00	1500.00	2745.00	1500.00	41.17	14000.00	25.62	15.55
2	Gram	0.50	30.50	1000.00	305.00	3000.00	9.15	20500.00	6.25	2.90
3	Vegetables	0.50	30.50	2000.00	610.00	1000.00	6.10	8400.00	2.56	3.54
					<b>Total</b>		<b>56.42</b>	<b>42900.00</b>	<b>34.43</b>	<b>21.99</b>
					<b>Grand Total</b>		<b>276.29</b>		<b>175.60</b>	<b>100.69</b>

  
 (P.K. Brahmmane)  
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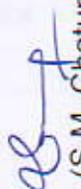
**PROPOSED CROPPING PATTERN AND PRODUCTIVITY AFTER IRRIGATION 6100**

Sl. No.	Crop	Area	Cost of Seeds (Rs/ Ha)	Cost of Fertilizer (Rs/ Ha)	Cost of Chemicals (Rs/ Ha)	Cost of Labour (Rs / Ha)			Misc Cost (Rs/ Ha)	Total Cost
						Mannual	Animal	Machine		
1	Wheat OLV	2000.00	5000.00	3000.00	5000.00	5200.00	1650.00	200.00	9000.00	29050.00
2	Wheat 3MV	2000.00	5000.00	3000.00	5000.00	5200.00	1650.00	200.00	9000.00	29050.00
3	Gram S2 RA	2100.00	6000.00	3000.00	3000.00	3200.00	1500.00	200.00	10500.00	27400.00
<b>Total Cost (Rs In laksh )</b>		<b>6100.00</b>	<b>326.00</b>	<b>183.00</b>	<b>263.00</b>	<b>275.20</b>	<b>97.50</b>	<b>12.20</b>	<b>580.50</b>	<b>1737.40</b>

**NET BENEFIT OF CROP PRODUCTION**

Sl. No.	Crop	Area	Cost of Product (Rs/ Ha)	Production n (Qtl/ Ha)	Price (Rs/ Quantity)	Production Amt	Expenditure (Rs. In Lakhs)	Capital of Production (Rs. In Lakhs)	Net Benefit (Rs Lakhs)
1	Wheat OLV	2000.00	29050.00	50	2000.00	100000.00	581.00	2000.00	1419.00
2	Wheat 3MV	2000.00	29050.00	50	2000.00	100000.00	581.00	2000.00	1419.00
3	Gram S2 RA	2100.00	27400.00	30	4800.00	144000.00	575.40	3024.00	2448.00
<b>Total Cost (Rs In laksh )</b>		<b>6100.00</b>					<b>1737.40</b>	<b>7024.00</b>	<b>5286.60</b>

  
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