

SALIENT FEATURES

SALIENT FEATURES OF DAUDHAN DAM

2.1 Name of the Project

Ken-Betwa Link Project

2.2 Daudhan Dam

S. No.	Particulars			
I	Location			
1.	States	Madhya Pradesh		
2.	Districts	Chhatarpur/Panna (M.P.)		
3.	River	Ken		
4.	Accessibility	From/To	K-B Link Canal	Daudhan Dam
		Airport	Khajuraho & Gwalior	Khajuraho (40 Km)
		Rail Head	Khajuraho, Ranipur, Jhansi	Khajuraho (40 Km)
		Road Head	Bamitha on NH-76 (Chhatarpur-Panna); Mauranipur on NH-76 and Jhansi	Bamitha on NH-76 (Chhatarpur-Panna) (28 Km)
5.(a)	Latitude	24 ⁰ 36'51"N		
(b)	Longitude	79 ⁰ 50'30" E		
II	Hydrology			
1.	Catchment area at heads works in sqkm	Gross	19633	
		Intercepted (by Existing, ongoing & contemplated projects)	10194	
		Unintercepted	9439	
2.	Catchment area insqkm	Rainfed	19633	
		Snowfed	Nil	
3.	Rainfall in mm	Annual	Monsoon	
(a)	Maximum	1604	1555	
(b)	Minimum	560	503	
(c)	Average	1124	1054	

4.	Designed flood (PMF) in cumec		
(a)	Dam	57202	
(b)	Weir/Barrage	-	
(c)	Flood control work/construction diversion	1118	
5.	Gross annual yield in MCM		
(a)	Maximum	18304	
(b)	Minimum	3830	
(c)	Average	9289	
6.	Available yield in MCM at	Annual	Monsoon
(a)	75% dependability	6590	5955
(b)	50% dependability	8431	7799
III Reservoir Data			
1.	Full reservoir level in m	288	
2.	Submerged area at FRL in ha	9000	
3.	Culturable land in ha	2473	
4.	Irrigated land in ha	542	
5.	Free board in m	5.05	
6.	Wave height in m	4.13	
7.	Live storage in MCM	2683.74	
8.	Dead storage in MCM	169.27	
IV Capacity in MCM at			
(a)	Maximum water level (288 m)	2853.01	
(b)	Full reservoir level (288 m)	2853.01	
(c)	Minimum draw down level (246 m)	344.75	
(d)	Dead storage level (240 m)	169.27	
V Sedimentation in MCM after			
		Year	
		50	100
(a)	Above MDDL (246 m)	85.7	98.0
(b)	Below MDDL	120.4	263.7
(c)	Encroachment of live storage (percent)	4.4	9.58
VI Assumed Annual Evaporation Losses from the Reservoir			
(a)	Quantum (MCM) Average	90.90	
(b)	Depth (m)	1.8352	

(c)	Submergence ratio (with reference to CCA)	0.0042
VII	MDDL in m	246
	Nos. of villages affected	10
	Population affected	8339
VIII	Benefited Districts	
	Madhya Pradesh	Chhatarpur, Tikamgarh & Panna
	Uttar Pradesh	Jhansi, Mahoba, Banda & Lalitpur
IX	Head Works	
	Dam	Earth and Rock fill dam
(a)	Type of dam	Earth dam (Homogenous zoned/ Rock-fill)
(b)	Length of dam at top in m	
	(i) Right flank	1233
	(ii) Left flank	-
(c)	Top width in m	8
(d)	Maximum height above G.L. in m	
	(i) Right flank	77
	(ii) Left flank	-
(e)	Type of cut off and maximum depth in m	18 Open trench type(Upstream blanket/open trench/diaphragm/grout curtain combination of alternatives)
X	Masonry and Concrete Dam	
	(Non over flow section)	Daudhan dam left side
(a)	Type of dam (Masonry/Concrete/Composite/any	Concrete

	other	
(b)	El of top in m	293.00
(c)	El of deepest foundation in m	232.00
(d)	Length at top in m	262.00
(e)	Width at top in m	8.00
(f)	Width at deepest bed level in m	51.60
(g)	Maximum height above deepest foundation level in m	61.00
XI Spillway (Over Flow Section)		
(a)	Type of spillway (Ogee/chute/side channel/tunnel/siphon/any other type)	Side Channel
(b)	Full reservoir level in m	288.00
(c)	Maximum water level in m	288.00
(d)	Length in m	536.00
(e)	Maximum height above the deepest foundation level in m	71.00
(f)	Crest level in m	270.00
(g)	Number of gates	27
(h)	Type of gates	Radial
(i)	Size of gate in m	16 x 18.5
(j)	Maximum discharging capacity (cumec) at FRL and MWL	57202
(k)	Flood lift in m	-
(l)	Tail water level in m	
	i) Maximum	241.00
	ii) Minimum	233.00
(m)	Type of energy dissipation	Ski-Jump bucket type

	arrangements	
XII	River Sluice(s), Irrigation, Power Outlet(s)	
a)	Purpose	Irrigation
b)	Number	2
c)	Size in m	1.6 x 2.4
d)	Sill level in m	237.2
e)	Discharging capacity (cumec) at Minimum draw down level	40.00
XIII	Barrage	No barrage proposed
XIV	Guide Bunds/Afflux Bunds	No guide bund is proposed in this project.
XV	Weir	No weir is proposed in this project.
XVI	Head Regulator(s)	No head regulator is proposed since the link canal has been proposed to draw water through Upper Level Tunnel.

2.2.1 Ken-Betwa Link

1.	Length of Main Canal	
	i) Open Canal	0 to 218 Km (218 km long)
2.	FSL at head in m	257.00
3.	Discharge	
	i) Discharge at head in cumec	159.9
	ii) Discharge at tail in cumec	41.43
4.	Bed width	13.2 m at head and 10 m at tail
5.	FSD in m	
	i) FSD at head	4.6
	ii) FSD at tail	3.0

6.	Bed slope RD 0 to 102 Km RD 102 to 171 Km RD 171 to 216 Km RD 216 to 218	1:9000 1:10000 1:11300 1:12000
7.	Velocity at head	1.28 m/s
8.	Diameter of Upper Level Tunnel	8.5 m

2.2.2 Pressurised Micro Irrigation System

(a) For MP Portion

Sr. No.	Particulars	Unit	PH1	PH1	PH2	PH3	PH4	PH5	PH6	PH7
			Chhatarpur	Chhatarpur	Chhatarpur	Chhatarpur	Chhatarpur	Chhatarpur	Tikamgarh	Niwari
	RD (KM)		18	18	44.4	70.7	86.3	102.0	171.0	207.0
1	CCA	Ha	23678	20000	22730	29322	15823	20860	25112	25000
2	Duty	lit./sec/ha	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
3	Discharge	Cumecs	9.47	8.00	9.09	11.73	6.33	8.34	10.04	10.00
4	CCA Level	M	300.00	345.00	270.00	270.00	255.00	280.00	290.00	240.00
5	Diameter	M	2.40	2.20	2.35	2.67	1.96	2.25	2.47	2.46
6	Velocity	M/S	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.10
7	Length	km	5.00	25.00	2.00	2.00	2.00	2.00	2.00	2.00
8	Frictional Loss	M	4.84	26.75	1.98	1.70	2.46	2.09	1.87	1.87
9	Provision for exit gradient	M	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00
10	D.C LEVEL	M	349.84	416.75	316.98	316.70	302.46	327.09	336.87	286.87
11	BACK									
12	MDDL	M	252.00	252.00	245.80	244.70	243.04	241.03	232.75	223.50
13	Static Head	M	97.84	164.75	71.18	72.00	59.42	86.06	104.12	63.37
14	Designed Head	M	97.84	164.75	71.18	72.00	59.42	86.06	104.12	63.37
15	required power	KW	10873.71	15465.93	7594.49	9910.02	4413.10	8426.03	12272.51	7436.57
16	required power	MW	10.87	15.47	7.59	9.91	4.41	8.43	12.27	7.44
Total CCA 182525 ha										
Total Power Requirement in 76.39 MW										

(b) For UP Portion

S. No.	Particulars	Pumping station 2 (From RD 70.7 km of KBL)	Pumping station 3 (From RD 171 km of KBL)	Pumping station 4 (From RD 207 km of KBL)
		Mahoba& EnrouteCommand	KBL	KBL
1.	CCA (ha)	42214	5568	7270
2.	Duty (lit./sec/ha)	0.40	0.40	0.40
3.	Discharge (cumec)	16.89	2.23	2.91
4.	Max CCA level (m)	250	241	230
5.	MDDL (m)	245	233.6	225.8
6.	Velocity (m/sec)	1.8	1.8	1.8
7.	Diameter (m)	3.46	1.26	1.43
8.	Length (m)	7000	10000	9000
9.	Static head (m)	5.0	7.4	4.2
10.	Frictional loss (m)	3.34	13.15	10.36
11.	Command area loss (m)	9.60	18.00	9.60
12.	Provision for exit gradient and filter losses (m)	25.00	25.00	25.00
13.	Design head (m)	42.94	63.55	49.16
14.	Power requirement for highest command level (KW)	9315	1818	1836
Total CCA 55,052 ha				
Total Power Requirement 12970 KW				

2.2.3	Ken LBC	
1.	GCA in ha	200000
2.	CCA in ha	139848
3.	Duty in lit./sec/ha	0.41
4.	Discharge in cumec	57.34
5.	Max CCA level in m	210.00
6.	MDDL/level no power requirement in m	246.00/260.00
7.	Velocity in m/sec	1.8
8.	Diameter in m	3.19
9.	No. of rising main	2

10.	Length in m	90000
11.	Static head in m	-36.00
12.	Frictional loss in m	26.83
13.	Command area loss in m	18.00
14.	Provision for exit gradient and filter losses in m	5.00
15.	Design head in m	13.83
16.	Power requirement for highest command level in KW	9262
17.	Total Power Requirement in MW	10.2

2.2.4 Design Features of Pumping Stations of Panna&Hatta Lift and Power Requirement					
S. No.	Particulars	KBL Saleha lift from Daudhan reservoir (Pannadistrict)			
		Rising Main in Tunnel	Amanganj Hose Irrigation including 20101 ha on Hatta	Gunnore & Devendranagar MI	Water Supply for Panna
1.	CCA in ha	90101	45101	45000	0
2.	Duty in lit./sec/ha	0.41	0.43	0.39	
3.	Discharge in cumec	32.92	17.29	15.63	5.00
4.	Max CCA level in m	342.4135	325.00	350.00	400.00
5.	MDDL in m	246	337.58	337.77	325.00
6.	Velocity in m/sec	1.8	1.5	1.5	1.5
7.	Diameter in m	4.83	3.83	3.64	1.20
8.	Length in m	7000	18000	21000	40000
9.	Static head in m	96.4	-12.6	12.2	75.0
10.	Frictional loss in m	2.39	5.39	6.61	38.23
11.	Command area	0.00	21.60	25.20	0.00

	loss in m				
12.	Provision for exit gradient and filter losses in m	0.00	5.00	25.00	5.00
13.	Design head in m	98.81	19.41	69.04	118.23
14.	Power requirement for highest command level in KW	77835	3919	12605	6904
Total Power Requirement 101.26 MW					

2.2.5	Hydropower at Daudhan Dam	
1.	Head Race	Tunnel for PH-II (Lower level tunnel)
(a)	Length in km	1.1
(b)	Shape	Modified horse shoe
(c)	Size in m	5.5
(d)	Thickness of lining in m	0.35
(e)	Designed discharge in cumec	65.19
(f)	Invert level in m at	
	(i) Inlet	244.60
	(ii) Outlet	243.20
(g)	Free flow/pressure in m	Free flow
2.	Balancing reservoir	No balancing reservoir is proposed.
3.	Forebay	No forebay is proposed.
4.	Surge tank/shaft	
(a)	Type	Restricted orifice type, Circular
(b)	Size (dia.) in m	18
(c)	Height above foundation level in m	60
(d)	Top level in m	305.00
(e)	Capacity in cumec	1000
(f)	Surge level in m	
	(i) Maximum	295.00
	(ii) Minimum	255.00

5.	Penstocks/pressure shafts	PH-I	PH-II
(a)	Number	2	3
(b)	Diameter in m	4.5	2.4
(c)	Length in m	84.35	120
(d)	Size of gate in m		
(e)	Bifurcations at lower end, if any		
(f)	Invert level in m	240.75	238.80
6.	Power house		
(a)	Type (surface/underground)	Surface	
(b)	Head in m	Gross	Net
	(i) Maximum	54.0	52.92
	(ii) Minimum	18.0	17.28
	(iii) Average	43.3	41.60
	(iv) Design	42.0	41.00
(c)	Dimensions in m	88.5 x 22	
(d)	Installed capacity in MW	60	
(e)	Turbine(s)		
	(i) Type	Vertical shaft, Kaplan	
	(ii) Number	2	
	(iii) Capacity in hp	30	
(f)	Type of generator	3 Phase, core or shell	
(g)	Number of standby unit(s)	Nil	
7.	Tail Race	PH-I	PH-II
(a)	Length in m	405	255
(b)	Water level in m		
	(i) Maximum	234.000	246.000
	(ii) Minimum	234.000	246.00
(c)	Size of draft tube gates in m	5 x 4.4	5 x 4.0

2.3.4 Command Area & Water Utilization from Ken-Betwa Link Project

I. No.	Canal system	Area in ha						Utilization in MCM										
		CCA as per DPR (Original)		Annual irrigation as per DPR (Original)		CCA as per Comprehensive Project Report		Irrigation utilization		Domestic & Industrial requirement		Transmission losses		Total		Environmental flow	Grand Total (MP + UP)	
		MP	UP	MP	UP	MP	UP	MP	UP	MP	UP	MP	UP	MP	UP			
1	Canal system under Daudhan dam																	
1	K-B Link Main Canal	46531	13763	46531	13763	138847	58585	701.782	327.68	60	66.77			761.782	394.45			1156.232
2	High level Command by Pumping from Pumping House No. 1 at RD 18 Km.					43678		220.765						220.765				220.765
3	Ken LBC	172853		233763		139848		706.842						706.842				706.842
4	Bariarpur PUW Through Dam-	46269	213610	58291	252017	38890	192479	224.015	1305.77					224.015	1305.77	493.6		2023.385
	(i) In Chhatarpur distt.																	
	(ii) Panna district	22184		31296														
5	Lift From Daudhan Dam-Panna district					70000		331.634						331.634				331.634
6	Lift From Daudhan Dam-Damoh district					20101		104.653						104.653				104.653
	Total under Daudhan dam	287837	227373	369881	265780	451364	251064	2289.7	1633.45	60*	66.77*		-	2349.7	1700.22	493.6		4543.52
	Total under Daudhan dam	515210		635661		702428		3923.15		126.77				4049.92		493.6		4543.52
II	Bina Complex Project					96000		324.95						413.35		6.51		419.86
III	Kotha Barrage					20000		80.69						88.19		2.5		90.69
IV	Lower Orr Project					90000		285.77						291.77		44.9		336.67
	Total					206000		691.41						101.9				847.22
	Grand Total	515210		635661		908428		4614.56						4843.23		547.51		5390.74

* Only Domestic Demand

** Domestic & Industrial Demand

2.3.5 Power Requirement of KBLP Micro Irrigation

S. No	Name of State	CCA (ha)	Power Requirement (MW)
1.	Ken –Betwa Link Canal		
(a)	MP (8 Lifts)	182525	76.39
(b)	UP (3 Lifts)	55052	12.97
	Sub Total	2,37,577	89.36
(c)	Ken left bank canal	139848	10.2
(d)	Panna&Hatta LIS	90101	101.26
	Total of Daudhan Dam Canal System	467526	200.82
2.	Lower Orr Project	90000	14
3.	Kotha Barrage	20000	5.39
4.	Bina Complex Multipurpose Project	96000	25.66
	Grand Total	6,73,526	245.87

Abstract Of Cost					
Comprehensive Report of Ken- Betwa link Project					
(Price level 2020-21)					
(Rs. in Crore)					
Sl. No.	Component	Unit-I	Unit-II	Unit-III	Total
		Head works	Canals	Power	
1	Component as per DPR				
I	Daudhan dam and canals				
<i>i</i>	<i>Daudhan dam</i>	<i>10899.65</i>	<i>-</i>	<i>-</i>	<i>10899.65</i>
<i>ii</i>	<i>Two new barrages of UP(Proposed Marauli and Pailani barrges near Banda)-subject to preparation of DPR of this part</i>	<i>2000.00</i>			<i>2000.00</i>
<i>iii</i>	<i>K-B link canal(Main)</i>	<i>-</i>	<i>10472.58</i>	<i>-</i>	<i>10472.58</i>
<i>iv</i>	<i>Ken LBC System</i>	<i>-</i>	<i>6734.79</i>	<i>-</i>	<i>6734.79</i>
<i>v</i>	<i>Panna and Hatta lift</i>	<i>-</i>	<i>5409.58</i>	<i>-</i>	<i>5409.58</i>
<i>vi</i>	<i>Repairing/Renovation of Ken Canal system of UP-subject to preparation of DPR of this</i>		<i>1000.00</i>		<i>1000.00</i>
<i>vii</i>	<i>Renovation of Mahoba tank with its connecting canal-subject to preparation of DPR of this part</i>		<i>500.00</i>		<i>500.00</i>
<i>viii</i>	<i>Power House-I</i>	<i>-</i>	<i>-</i>	<i>395.56</i>	<i>395.56</i>
<i>ix</i>	<i>Power House-II</i>	<i>-</i>	<i>-</i>	<i>146.59</i>	<i>146.59</i>
<i>x</i>	<i>Repairing /Strengthen of Barriyar PUW, Parichha weir,Barwa sagar etc (Lump sum provision)</i>	<i>220.00</i>	<i>-</i>	<i>-</i>	<i>220.00</i>
	<i>Sub-total</i>	<i>13119.65</i>	<i>24116.94</i>	<i>542.15</i>	<i>37778.75</i>

SALIENT FEATURES OF LOWER ORR PROJECT

SALIENT FEATURES					
1	Name of the project		Lower Orr Project		
	Type of project		Multipurpose		
	Location		Ashok Nagar, Shivpuri Madhya Pradesh		
2	River Basin		Betwa		
	Name		Orr		
	Located in State(s):		Madhya Pradesh		
	i) Countries (if international river)		NIL		
	River/Tributary		Orr		
			Tributaries - Makua, Reba		
3	State(s)/ District(s)/ Taluka(s) or Tehsils in which following are located		State	District	Tehsils
		(a) Reservoir	M.P	Ashok Nagar, Shivpuri	Chanderi/ khaniadhana
		(b) Headwork	M.P	Ashok Nagar, Shivpuri	Chanderi/ khaniadhana
		(c) Command Area	M.P	Shivpuri Datia	Khaniadhana, Pichhore Kakera, Narwar Datia
		(d) Power House	No Power House		
3.1	Name of Village near the Head-Works		Village: Didauni Tehsil: Khaniadhana		
3.2	Location of Head-Works				
		(a) Longitude	780 05' 55"E		
		(b) Latitude	240 50' 50"N		
		(c) Seismic	Zone II		
3.3	Access to the Project	Name	Distance		
	Airport	Gwalior, Bhopal	195 km 240 km		

	Rail Head	Lalitpur	60 km
	Road head (from Rajbagh)	Chanderi	22 km
4	International/Interstate aspects of the Project : NIL		
5	Catchment area of the basin		1843 sq. km
	Submergence due to projects	In M.P.	2723.70 ha (Whole in M.P.)
	Proposed annual utilization by the project	(i) Drinking water	6.00 MCM
		(ii) Environmental Flow	44.90 MCM
		(iii) Evaporation Loss	21.30 MCM
	Minimum agreed/proposed flow in the river for maintaining ecology		44.90 MCM.
6	Estimated life of the project (years)		100 yrs.
7	Irrigation	(Ha.)	
		Area under irrigation (break up)	
		(i) Kharif	Nil
		(ii) Rabi	90000 hectare
		(iii) Zaid	Nil
		District(s) benefited	Shivpuri, Datia of M.P.
8	Water Supply	annual	6.00 MCM Drinking
9	Data (average of all stations in command area)		
			Maximum Minimum
		(a) Air temp.(0C)	45 3.8
		(b) Seismic Zone	Zone- II
		(c) Maximum probable flood	12704 Cumec(m /s)
10	River flows (minimum observed)		
		(a) Water level (EI-m)	339.00 m
		(b) Discharge(m ³ /s)	0.02 Cumecs (April, 1995)
		(c) Months of 'nil' flow. If any	May, June

10.1	Reservoir			
10.2	Water levels (EI-m)			
			(a) Maximum Water Level (MWL)	380.40 m
			(b) Full Reservoir Level (FRL)	380.00m
			(c) Minimum Drawdown Level	360.50m
			(d) Dead Storage Level	360.50m
10.3	Outlet levels			
			(a) Irrigation	360m
			(b) Power	No Hydro Power
10.4	Other parameters			
			(a) Free board	2.94 m
			(b) Live storage	328.17 MCM
			(c) Gross storage	371.80 MCM
10.5	Sedimentation rate and levels			
			(a) Rate	0.33 mm/Year
			(b) New zero elevation after 50yrs.	351.80m
			(c) New zero elevation after 100yrs.	353.53m
11	Submergence			
11.1	Land and property submerged at MWL			
		(a) Revenue villages affected (no.)	Submergence	Canal System
		(i) Fully	7	
		(ii) Partially	5	
		(b) Land affected (ha)		
		(i) Gross	2723.70	
		(ii) Culturable	853.00	
		(iii) Un-Culturable	576.18	
		(iv) Forest	968.24	

		(v) Others	State Land:326.00 ha	Pvt agri land=240.2 ha State revenue land=23.52 ha, Forest land=23.52 ha
		(c)Buildings/houses(No.)		
		(i) Houses	869	
		(ii) Govt.		
		(iii)Temples		
		(iv) Mosques		
		(v)Govt/Pvt schools		
		(vi) Cattle Shed		
		(vii) Structure of cultural		
		(viii) Lift Irrigation		
		(d)Tube Wells/Bore Wells (No.)	93/257	
		(e) Road(km) under submergence		
		(f)Transmission lines (km.) under submergence	NA	
11.2	Total Population under Submergence			
			Families	
		(a) Total	944	
		(b) Scheduled Castes	Not Available	
		(c) Scheduled Tribes	Not Available	
11.3	Population effected under Main Canals and under distributaries			
12	Head works			
12.1	Dam (Non-overflow section)			
		(a) Type of dam	Composite earthen and concrete dam	
		(b) EL of top(m)	384.00m	
		(c) Length of Over Flow section	247.00 m	
		(d) Length at the river bed(m)	180.00m	
		(e)Width at top(m)	8.00 m	

12.2	Spillway(overflow section)		
		(a) Location of spillway	Provided within the body of dam
		(b) Type of Spillway	Ogee
		(e) Max height above the deepest foundation(m)	45.00 m
		(f) Crest level (EL-m)	370m
		(g) Number of gates	12
		(h) Type of gate	Radial
		(i) Size of gate	15m(W)x10m(H)
		(ii) FRL	380.00 m
		(i) MWL	380.40 m
		(j) Tail water level (EL)	
		(i) Maximum	-
		(ii) Minimum	-
		(k)Type of energy dissipation arrangement	Stilling basin
12.3	U/S Cofferdam		
		(a) Height of U/S coffer dam	-
		(b) EL of top	-
12.4	D/S Cofferdam		
		(a) Height of D/S coffer dam	-
		(b) EL of top	-
12.5	Head Regulator(s)	Left side	Right side
	(a) Total length	104.95	Not provided
	(b) Height above deepest	40.50m	

	(c) Length of bay(m)	5.00m	
	(d) Sill level (EL-m)	360m	
	(e) Number of gates	2	
	(f) Type of gates	Vertical type	
	(g) Size of gate	2.5x 4.0 m	
	(h) Type of hoisting arrangement	Rope & Drum	
13	Canal System		
	14.1 Main canal	Left bank canal	
		14.1.1 Purpose of canal	Irrigation & water supply
		14.1.2 Type of canal	Carrier contour
		(a) Flow/lift	Both
		(b) Lined/unlined	Lined
		(d) Type of lining	100mm thick M15 PCC (0 to 3.1 km)
			75mm thick M15 PCC (3.1 to 50.00 km)
	14.2 Design data	Left Bank Canal	
	(a) Length (km)	66.67 km	
	(b) Full supply level at head	361.80 m	
	(c) Full supply depth at head	3.80 m	
	(d) Side slope(EL- m)	1.5:1	
	(e) Bottom width of canal upto spill channel	4.35 m	
	(f) Maximum discharging	NA	
	(i) At head	34.00 (0 to 3km) cumec	
	(ii) At tail	20.00 (3 to 66.67 km)cumec	

14.	Cropping Pattern	Name of crop (season- wise)	Area (ha)
	(i) Rabi Season	(a) Wheat (HYV)	39105
		(b) Wheat (ORD)	31995
		(c) Gram N2	7101
		(d) Gram N1 (Peas)	9999
		(e) Other Vegetables	1800
15.	Power	Type	Solar Power
		Installed capacity (MW)	19 MW about 36 ha over submergence Area in the reservoir
16	Total Project Cost (Rs in Crore)	2864.76	
17	BC Ratio	1.43	
	IRR	11.15%	

SALIENT FEATURES OF KOTHA BARRAGE PROJECT

S. No.	Particulars	
I	Location	
1.	State	Madhya Pradesh
2.	District	Sagar
3.	River	Betwa
4.	Accessibility	Kotha dam site is situated near village Kotha 30 km from Kurwai distt. Vidisha
5.	Toposheet	54L/4
6.	Latitude	24°03'28" N
7.	Longitude	78°01'16" E
8.	Nearest railway station	Mandi, Bamora/Kurwai
9.	Nearest airport	Bhopal
II	Hydrology	
1.	Catchment area in sqkm	8711
2.	Maximum annual rainfall in mm	1645.8
3.	Minimum annual rainfall in mm	779.4
4.	Average annual rainfall in mm	1170.60
5.	Designed flood (PMF) cumec	16457
6.	75% dependable yield in MCM	1593.99
7.	50% dependable yield in MCM	2016.10
III	Reservoir Data	
1.	Gross storage in MCM	63.51
2.	Live storage in MCM	63.22
3.	Dead storage in MCM	0.29
4.	Gross area of submergence at FRL in ha	1359
	Private land in ha	681
	Revenue land in ha	678
	Forest land in ha	0.0
IV	Barrage Data	
1.	Type of barrage	Concrete
2.	Total length of barrage in m	576
3.	Height of barrage in m	16.50
4.	Number of openings	32
5.	Size of gates in m	15.00 x 11.50
6.	Crest level in m	384.50

7.	Thickness of pier in m	3
8.	Top of bund level in m	398.00
9.	Full Reservoir Level in m	395.00
V	Canals	
1.	Length of rising main (Left) in km	11.50
2.	Length of rising main (Right) in km	8.50
3.	Dia. of rising main (Left) in m	1.60
4.	Dia. of rising main (Right) in m	1.60
5.	Lift (Left) in m	31
6.	Lift (Right) in m	26
VI	Irrigation	
1.	GCA (Left) in ha	15380
2.	GCA (Right) in ha	15380
	Total GCA in ha	30760
3.	CCA (Left) in ha	10000
4.	CCA (Right) in ha	10000
	Total CCA in ha	20000
5.	Annual Irrigation	
	(a)Kharif in ha	5500
	(b) Rabi in ha	20000
	(c) perennial	Nil
	Total Annual irrigation in ha	25500
10.	Benefited districts	Vidisha and very small area of Sagar
11.	Solar Power Generation	8 MW
12.	Power Requirement	

SALIENT FEATURES OF BINA COMPLEX

S. No.	Particulars	Madia	Semra Ghat Feeder	Dehra	Chakarapur
I	Location				
1.	State	MADHYA PRADESH			
2.	District	SAGAR			
3.	River	Bina	Dhasan	Dehra Nalla	Bina
4.	Accessibility	42 km from sagar on sagar Bhopal Road	36 km from sagar on sagarRahatgarh Road	36 km from sagar on sagarRahatgarh Road	50 km from sagar on sagar Vidisha Road
5.	Latitude	23 ⁰ 45'11"	23 ⁰ 46'17"	23 ⁰ 48'11"	23 ⁰ 50'27"
6.	Longitude	78 ⁰ 23'24"	78 ⁰ 32'43"	78 ⁰ 26'37"	78 ⁰ 23'16"
II	Hydrology				
1.	Catchment area sqkm.	1109.84	314.00	62.90	187.80
2.	Maximum annual rainfall (mm)	1640.7 mm	1245.7 mm	-	1840.30 mm
3.	Minimum annual rainfall (mm)	767.20 mm	814.4 mm	-	590.20 mm
4.	Average annual rainfall (mm)	1170.60 mm	1223.50 mm	1201.68	1201.68 mm
5.	Designed flood (PMF) cumec.	6647.00	2310	932	8241
6.	Gross yield (MCM)	294.04	89.30	17.10	51.00
7.	Available run off at site (MCM)				
8.	75% dependable annual	294.04	89.30	17.10	51.00
9.	Reserve for U/S (MCM)	24.00	Nil	Nil	Nil
10.	Reserve for D/S (MCM)	6.00	Nil	Nil	Nil
III	Reservoir Data				
1.	Maximum water level, m	500.65	499.8	492	453.00
2.	Full reservoir level, m	500.55	499.7	491.60	451.50
3.	Submerged area, ha.	6435.60	575.00	754.60	1349.50

I	Private land, ha.	5624.17	525.00	335.96	910
II	Other lands, ha.	680.45	50.00	40	68.01
III	Forest land, m	130.98	nil	378.64	462.52
IV	Other Land				
i	Power House ha	15.00		1.00	
ii	Canal ha				105
iii	Road Diversion ha			26.30	
iv	Pipe canal ha				
v	Feeder Channel Semra Ghat Feeder to Dehra ha			39	
4.	Dead storage level, m	487.62	495	465.35	435.75
5.	River bed level m	481	490.48	459.00	427
6.	Top of bund level m	504.55	501.80	494.00	456
7.	Height of dam m	23.55	11.32	35.00	25.00
8.	Gross storage (MCM)	270.10	6.46	72.36	74.31
9.	Live storage (MCM)	267.67	6.00	72.35	73.84
10.	Dead storage (MCM)	2.429	0.46	0.01	0.47
11.	Length of main dam m	2070	1440	3509	751.68
12.	Saddles, Nos.	1 (6.71m high)	Nil	2 (5m high)	2 (8m & 3m high)
13.	Total length of saddles, m	1500m	Nil	(30m & 2148m)	(131.884m & 516.65m)
14.	MDD Level, m	492.50	-	484	439.5
15.	Feeder channel Semra Ghat Feeder to Dehra km.			8.0 Km with average depth of cutting 10 m	
V	Irrigation				
1.	Design irrigation	96,000 Ha. (Kharif Nil Ha , Rabi 90,000 Ha.& Basin Lift 6000 Ha)			
2.	CCA, Ha.	96,000 Ha			
VI	Drinking purposes (MCM)	19.20			
VII	Industrial Use (MCM)	25.00			
VIII	Total Village affected (84 no.)	59	8	6	11

IX	Total Benefited Village	296 no.
	Khurai Tehsil	167 no.
	Malthone Tehsil	107 no.
	Bina Tehsil	22 no.
X	Hydropower	
1.	Hydro Power component	Yes
2.	Hydro power generation	