

UPPER NARMADA PROJECT

SECTION – II

SALIENT FEATURES

2.1	Name of the project	-	Upper Narmada Dam Project
2.2	General		
2.2.1	River Basin		
	(a) Name	-	Narmada Basin
	(b) Located in :		
	i) State	-	Madhya Pradesh
	ii) State (if inter-state river)	-	Madhya Pradesh Maharashtra and Gujrat State
	iii) Countries (if international river)	-	-
2.2.2	Name of :-		
	a) River .	-	Narmada
	b) Tributary	-	-
	c) State(s)	-	Madhya Pradesh Maharashtra and Gujrat
	d) Districts	-	
	i) Reservoir	-	Mandla&Shahdol
	ii) Head works	-	Mandla&Shahdol
	iii) Command area	-	Mandla&Shahdol
	iv) Power house	-	Not applicable.
	e) Tehasils :-		
	I. Reservoir	-	Dindori (Mandla) and Rajendragram (Shahdol)
	II. Head works	-	-“-
	III. Command area	-	-“-

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	iv)	Power house	-	Not applicable		
	f)	Village near head works.	-	Majhiakhar		
2.2.3	Location of :-					
2.2.3.1	Head works :					
	(a)	Longitude	-	81 ⁰ – 20 – 26''		
	(b)	Lantitude	-	20 ⁰ –51' – 30''		
2.2.3.2	Project area : reference to					
	a)	Degree sheets	-	Toposheet No. 64-F/5		
	b)	Index map	-	64-F/5, 64-F/6 & 64-F/9		
2.2.4	Access to the Project	Name	Distance from project site.			
	a)	Air port	Jabalpur	180 Kms		
	b)	Rail Head	Pendra Road	96 Kms		
			Bilaspur-Katni Railway.	96 Kms.		
	c)	Road Head (National Highway) N.H. -7	Jabalpur on	180 Kms		
	d)	Road Head (State Highway)	Gadasarai S.H. -7	5 Kms.		
	e)	Sea port	Not applicable			
2.2.5	Estimated life of the project (years)					
			-	100 Years		
2.3	Type of Project					
			-	Irrigation.		
2.3.1	Irrigation (Hactare)		-	<u>By Flow</u>	<u>By lift</u>	<u>Total</u>
				<u>LBC</u>	<u>RBC</u>	
	a)	GCA (Gross command area)		9849	6210	10272
						26331
	b)	CCA (Culturable command area)		9848	58780	8458
						21284

c) Area under irrigation	-	<u>L.B.C.</u>	<u>R.B.C.</u>	<u>Total</u>
(break up) Proposed.		<u>Flow</u>	<u>Lift</u>	
i) Kharif		4073.60	4958.60	12478.2
ii) Rabi		3222.40	3922.50	9870.89
iii) Hot Weather		-	-	-
iv) Two seasonal		-	-	-
v) Perinnial		-	-	-
vi) Gross irrigated		<u>L.B.C.</u>	<u>R.B.C.</u>	<u>Total</u>
area (**) GIA		Flow	Lift	
		7296.00	8881.00	22349
vii) Intensity of Irrign.		$\frac{(G.I.A \times 100)}{\text{Service area}}$	=	120%

(**) Irrigated area under Kharif, two Seasonal, Perinnial, Rabi, and Hot weather shall be indicated.

d)	Cost per Hactare of gross area irrigated	-	Rs. 32,668
e)	Cost per thousand cubic meter of gross/live head out let)	-	Rs. 5.85
2.3.2	Power	-	No power is planned
2.3.3	Flood control	-	No flood control is planned.
2.3.4	Navigation	-	No. Navigation is planned.
2.3.5	Water supply	-	Not planned

2.3.6	Project performance	Period	simulation	No. of failures
a)	Irrigation	1 Year	-	Nil
b)	Power	-	-	-
c)	Flood control	-	-	-
d)	Water supply	-	-	-
e)	Navigation	-	-	-
2.4.	Hydrology :			
2.4.1	Catchment area at	-	480 Sq. miles	
2.4.1	Catchment area at Head work site (Km ²)			
a)	Gross	-	1243.20 Sq.Km	
b)	Intercepted	-	Nil	
i)	By existing project	-	Nil	
ii)	By ongoing project	-	-	
iii)	By contemplated Project	-	-	
Note : - In case of a D/S Weir/gauge regulating The supply to the canal As similar details shall Be furnished for the Catchment between Head Works and the weir/ Barrage.				
2.4.1.2.	Catchment area.			
a)	Rainfed	-	1243.2 Sq. Km	
b)	Snow fed	-	-	

2.4.2 Precipitation

- Nil

2.4.2.1 Catchment	:	Period of record	:	1931 to 1979
		Rainfall (weighted) mm.		Snow fall (Annual) mm.
		Annual		Monsoon (June- October)
a) Average		1372.87 mm		1198.12 mm
b) Maximum		2174.75 mm		1952.50 mm
c) Minimum		781.mm		697.23 mm
d) Co-efficient of Variation.				

2.4.2.2 Command

Cropping season

	Annual Kharif (June-Oct.)	Rabi (Nov-Feb.)	Hot weather (March- May)
a) Average	12478.70 ha	9870.80 ha	Nil
b) 80% dependable			
c) Average monthLY E.T.O. (MM)	130	92	156

2.4.3 Annual yield calculated at the proposed site Cum period of Record.

a) Maximum	-	0.9805 BM ³	1949	1979
b) Minimum	-	0.1633 BM ³		
c) Average (Percent)	-	0.4766 BM ³		
d) Dependable (Percent)		Annual		
i) 50%	-	0.4875 BM ³		
ii) 75%	-	0.4000 BM ³		
iii) 90%	-	0.2700 BM ³		

2.4.4 Climatic data.

2.4.4.1 Command	Names of		Period of record
	station		(1951 to 1976)
	Normal	Max.	Min.
a) Air Temp. (°C)	Mandla	46.8°C	2°C
b) Humidity (%)	Mandla	92%	13%
c) Wind (Km/h)	Mandla	150	

2.4.5 Utilisation within the state (m.cm)

2.4.5.1 States share in case - At 75% dependable
Of inter state fiver yield of 28 M.A.F. state
Is allotted 18.25 M.A.F.

2.4.6 Floods near the head - Nil Work site

2.4.6.1 Historical period of - 1922 to 1979
record.

	Location	-	Dam Site
a) Maximum water level (EL -m)		-	712.6 m
b) Maximum discharge estimated (EL -m)		-	25470 cumecs
c) Year of occurrence		-	1936

2.4.6.2 Observed period of Record.

	Location	-	Dam Site
a) Maximum Water level (FL-m)		-	715.1m
b) Maximum discharge (Cumecs)		-	5255.2327
c) Year of occurrence		-	1974 (16.874 to 19.8.74)
Date (FL-m)		-	715.1m

2.4.6.3 Standard project
flood (Cumecs) - 8582.94 Cumecs

2.4.6.4 Maximum Probable
flood (Cumecs) - 8582.94 Cumecs

2.4.6.5	Flood at Jamtara		
	Frequency	-	Magnitude (Cumec)
	a) 50 Years	-	
	b) 100 Years		14,744.30 Cumecs
	c) 1000 Years		19,782 Cumecs
2.4.6.6	Design flood (Cum)		
	a) Dam	-	8582.94 Cumecs
	b) Weir/Barrage	-	Nil
	c) Flood control/ works/construct- ion/diversion.	-	Nil
2.4.6.7	River flows (Minimum observed)		
	a) Water level (El-m)	-	704.5 m
	b) Discharge (Cumecs)	-	0.75 Cumecs
	c) Month of nil flow	-	Nil
2.5	<u>RESERVOIR</u>		
2.5.1	Water level (El-m)		
	(a) Maximum water level	-	728.50
	(b) Full reservoir level	-	727.00
	(c) Minimum draw down Level	-	720.85
	(d) Dead storage level	-	718.65
	(e) Top Bund level	-	730.70
2.5.2	Free board (m)	-	2.20
2.5.3	Wave height (m)	-	2.794 m
2.5.4	Lie storage (M Cm)	-	88.30
2.5.5	Capacity at (M Cm)	-	
	a) Maximum Water level	-	154.00
	b) full reservoir level	-	125.00
	c) Minimum draw down level	-	36.73
	d) Dead storage level	-	20.32

2.5.6	Flood absorption capacity (Mom)		
a)	Below (F. R. L.)	-	88.27
b)	Between F. R. L.	-	29.00
2.5.7	Sedimentation after	-	Year
		50	- 100
a)	Above M.D.D.L.	-	- 1370.5665 ham
b)	Below M.D.D.L.	-	1701.60 - 2562.499 ham
c)	Encroachment of live storage (%)	-	-
2.5.8	Assumed annual losses evaporation from reservoir.		
(a)	Quantum (Average M cm)	-	0.000023972
(b)	depth (M)	-	1.70
2.6	<u>SUBMERGENCE</u>		
2.6.1	Land and property Submerged.	Level Maximum water (1)	Full reser - voir (2)
	(a) Villages affected (No.)		
i)	Full	18 Nos	18 Nos
ii)	Partial	Nil	Nil
	(b) Land affected (ha)		
i)	Gross	2283 ha.	1975 ha
ii)	Culturable	1341 ha.	1033 ha.
iii)	Irrigated	Nil	Nil
	(c) Building / houses (No)		
i)	Private	-	1952 Nos
ii)	Communities	-	17 Nos

		-			
	d) Wells (Nos)	-	92 Nos		
	e) Road/Rail (Km)	-	Nil		
	f) Transmission lines	-	Nil		
	g) Any other	-	<u>Temples</u>	<u>Schools</u>	<u>Trees</u>
			17 Nos.	12 Nos.	994 Nos.
2.6.2	Submergence Ratio (with reference to culturable command areas).	-	9.28%		
2.6.3	Number of families affected	-	2031 Nos		
2.6.4	Number of persons affected	-	9396 Nos		
2.6.5	Anticipated back Water levels at important places along the periphery of the reservoir.				
		S.No.	Name of Place	Back water Level (El-m)	
		-	-	-	
2.7	<u>HEAD WORKS.</u>				
2.7.1	Dam				
a.7.1.1	Earth and rock fill dam				
	a) Type of Dam				
	(Homogeneous/zonal Rock fill)	-	Homogeneous		
	b) Length of the dam at top (m)				
	I) Right flank	-	749.6 m		
	II) Left	-	1409 m		
	C) Top width (m)	-	7.62 m		

d) Max. height above G.L. (m)		
i) Masonry	-	29.6 m
ii) Right flank (earth)	-	19.58 m
iii) Left Flank (earth)	-	15.98 m
e) Dyke(s)	-	Nil
f) Type of out of and max. depths (upstream blanket - open trench/diaphragm/ groutcurtain/combination of alternatives)		Open cut off trench 6.72 m
2.7.1.2 Masonry & concrete dam (Non-overflow section) Left side Right side.		
a) Type of dam (Masonry/ concrete/composite/ any other	-	Composite
b) E. L. of top (m)	-	730.70m to 733.60 m
c) E. L. OF DEEPEST foundation (m)	-	703.00 m
d) Length at top (m)	-	122.00 m
e) Length at the river bed (m) -	-	-
f) Width at top (m)	-	7.62 m
g) Width at deepest bed level (m)	-	21.89 m
h) Maximum height above Deepest foundation level (m)		30.60 m
2.7.1.3 Spillway (Overflow section)		
a) Type of spillway (Ogee/Chute/Side channel/ Tunnel syphon/any other type.	-	Ogee
b) Full reservoir level (El-m)	-	727.00 m
c) Maximum water level (El-m)-		728.50 m
d) Length (m)	-	179.40 m

e) Maximum height above deepest foundation level (m)	-	23.10 m
f) Crest level (El -m)	-	719.60 m
g) Number of gates	-	10 Nos.
h) Size of gates	-	15.24 m x 7.40 m
i) Type of gate	-	Radial
j) Maximum discharging Capacity (cumecs) at F. R. L. & M. W. L.	-	At M. W. L. 8582.94 Cumecs
K) Flood lift (m)	-	1.50 m
l) Tail water level (m)	-	
i) Maximum	-	715.467 m
ii) Minimum	-	704.40 m
m) type of energy dissipation arrangement	-	Dented Roller bucket

Note :- Similar details shall
Be furnished for subsidiary - Nil
spillway if any

2.7.1.4 River sluice(s) Irrigation./ Power outlets

a) Purpose.	
b) Number	
c) Size (m)	
d) Discharging capacity	River sluice not provided.

At (cumed)

- i) Full reservoir level
- li) Minimum draw down level.

Note : The above details shall be
Furnished for all the sluice -
Provided for different
Purposes. -

2.7.2	Barrage	-	Not applicable
2.7.3	Wair	-	Not applicable
2.7.4	Head regulators	-	Left side & Right side.
	a) Total length (m)	-	70 m
	b) Height above deepest foundation (m)	-	6.90 m
	c) Length of bay (m)	-	51.50 m
	d) sill level (El-m)	-	718.65 m
	e) No. of gates	-	2 Nos.
	f) Size of gates	-	1.80 m x 1.6 m
	g) No. of silt excluder bays.		
	h) Type of energy dissipation arrangement	-	R. C. C. Friction blocks
2.8	<u>CANAL SYSTEM</u>		
2.8.1	Main Canal.	-	R. B. C., L. B. C. Lift & L. B. C. flow.
2.8.1.1	Purpose of canal : Irrigation/ Power/Navigation/ Diversion/Water supply/ Multipurpose.	-	Irrigation.
2.8.1.2	type		
	a) Flow/Lift.	-	Flow & lift
	b) Lined/Unlined	-	Lined
	c) Discharging capacity of channel above which lining is proposed	-	Lined upto 40 ha.
	d) Type of lining	-	C.C. lining.

2.8.1.3	Main Canal data.	Left Bank	Canal	Right Bank
		Flow	Lift	Canal
a)	Length (km)	55.37	44.95	54.05
b)	Full supply level at head (El-m)	720.85	750.60	721.72
c)	Full supply level depth at Head (m)	2.16	1.60	1.48
d)	Bed width at head (m)	2.72	1.84	1.65
e)	Side slope at head	1.5:1	1.5:1	1.5:1
f)	Bad slope range	1 : 5000 to 1 :2000	1: 3000 to 1: 2500	1: 4000 to 1: 2000
g)	Maximum discharging capacity at head (Cumecs)	11.5811	6.3743	4.4068
h)	Total No. of canal structures on mian & ranch canal.	110	84	66
i)	Total assumed losses across the structure(m)	-	Aqueduct @ 0.15m Canal syphon – 0.25m	
j)	Gross command area (ha) -	9849	10272	5878
k)	Culturable command area (ha)	6948	8458	5878
2.8.1.4	Branch Canal (s)	Flow Canal		Lift Canal
		<u>L.B.C.</u>	<u>R.B.C.</u>	<u>L.B.C.</u>
a)	Number	6	6	6
b)	Total length (km)	32	30	25
2.8.2 Effeciencies (%)			Kharif	Rabi
i)	Conveyance		55%	70%
ii)	Field application		80%	75%

2.9 CROPPING PATTERN

	Percentage (CCA)		Area
	Existing		Proposed (ha)
2.9.1 Name of crop (Seasonwise)			
i) Kharif	67%		12478.20
ii) Rabi	53%		9870.80
iii) Perennial	Nil		Nil
iv) Summer	Nil		Nil

Note : If there are different cropping patterns in different reaches of the canal information for each reach shall be given separately.

2.10 Power Nil Not applicable

2.11 Cost

2.11.1 Cost of the project
(Refer Volume II estimates)

	(Rs. Lakhs)	(Unit wise)
	2319.839	Unit I
	4981.320	Unit II

2.11.2 Allocated cost (Rs. Lakhs)

a) Irrigation	-	7301.159 Lakhs
b) Power	-	-
c) Water supply	-	-
d) Flood control	-	-
e) Navigation	-	-
f) Any other	-	-

2.12 Benefits/Revenue

Annual estimated.

	Quantity	Value (Rs. Lakhs)	Revenue (Rs. Lakhs)
a) Food production (Tonee)	88986	(Rs. 187.67	-
b) Power (Kwh)	Not applicable		

c) Food protection (ha)	Not applicable.		
d) Navigation (Tonnage)	Not application.		
e) Water supply (Population Serves)	Not applicable		
f) Any other (Fisherles)	100 T/ annum	5.00	2.48

2.12 Benefit cost ratio :

a) B. C. Ratio (Irrigation component)		
i) With 5% interest	-	3.87
ii) With 10% interest	-	2.17
b) Flood control component		
c) Power		
d) No. Of years when accumulated deficitwipedout.		Not applicable
e) Percentage return per annum after the deficit is wiped out (shall not be less than 11.5 percent)		

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