

Salient Features of Parbati - Kalisindh - Chambal Link Project

1.0	General			
1.1	Name of the Project	Parbati - Kalisindh - Chambal Link Project		
1.2	Purpose	Diversion of surplus water of Parbati river(tributary of Chambal), Newaj river(sub-tributary of Kalisindh) and Kalisindh river (tributary of Chambal) to Chambal river at Rana Pratap sagar or alternatively at Gandhi Sagar for extending irrigation enroute of the link and drought prone areas of Upper Chambal sub-basin.		
1.3	River basin			
(a)	Name	Chambal		
(b)	Location	Madhya Pradesh and Rajasthan		
2.0	Head Works	Patanpur dam	Mohanpura dam	Kundaliya dam
2.1	Location			
(a)	State	Madhya Pradesh	Madhya Pradesh	Madhya Pradesh
(b)	District	Rajgarh	Rajgarh	Rajgarh
(c)	Tehsil	Biaora	Biaora	Zeerapur
(d)	River	Parbati	Newaj	Kalisindh
(e)	Sub-basin	Parbati	Kalisindh	Kalisindh
(f)	Access to the project	Patanpur dam	Mohanpura dam	Kundaliya dam
i)	Air port	-	-	-
ii)	Railway station	On Maksi-Guna line, Biaora Rly. Station 38 km from the Project site.	On Maksi-Guna line, Biaora Rly. Station 11 km from the Project site.	On Maksi-Guna line, Biaora Rly. Station 80 km from the Project site.
iii)	Road	NH-3 from Mumbai-Agra road 38 km from Project site.	NH-3 from Mumbai-Agra road 3.0 km from Project site.	Jhalawar-Ujjain highway 7.0 km from Project site.
2.2	Hydrology	Patanpur dam	Mohanpura dam	Kundaliya dam
(a)	Catchment area (sqkm.)	5312	3594	5953
(b)	75% dependable yield (Mm ³)	1934	862	1278
(c)	50% dependable yield (Mm ³)	2370	1266	1827
(d)	Surface water available for transfer at 75% dependability	948	444	610
(e)	Design flood (cumec)	10121	10637	11539

2.3	Reservoir data				
(a)	Top level of the dam (m)		421.62	403.00	382.00
(b)	Max. water level (m)		419.62	401.50	379.50
(c)	Full reservoir level (m)		419.00	400.00	378.00
(d)	Minimum draw down level (m)		407.00	390.00	369.20
2.4	Storage details				
(a)	Gross storage at FRL (Mm ³)		156.00	140.00	1234.00
(b)	Live storage capacity (Mm ³)		110.00	87.50	959.00
(c)	Dead storage capacity (Mm ³)		46.00	52.50	275.00
(d)	Submergence at FRL				
	1. Area (ha)		2998.00	2510.00	11800.00
	i) Forest land		68.89	-	175.51
	ii) Irrigated land		219.69	236.51	1699.08
	iii) Unirrigated land		1869.16	1073.26	5447.25
	iv) Culturable waste land		418.08	827.80	1668.90
	v) Area not available for Cultivation		422.17	372.11	2809.68
	2. Villages		22	8	35
	3. Population		4255	2530	20270
2.5	Non overflow dam				
(a)	Type		Concrete gravity	Concrete gravity	Concrete gravity
(b)	Length of left transition (m)		60.00	60.00	60.00
(c)	Length of right transition		60.00	40.00	60.00
(d)	Maximum height from average N.S.L. of river bed (m)		19.62	24.50	45.00
(e)	Top width (m)		6.00	6.00	8.00
2.6	Spillway				
(a)	Type		Ogee spillway	Ogee spillway	Ogee spillway
(b)	Length of spillway (m)		197.00	176.00	228.50
(c)	Crest level (m)		409.29	389.50	369.00
(d)	Average N.S.L. of river bed (m)		402.00	378.50	337.00
(e)	Type of gate		Radial	Radial	Radial
(f)	No. of gates		(18+1)	(16+1)	(20+2)
(g)	Size of gates		8.0m x 10.5 m	8.0m x 12.0 m	8.0m x 10.5 m

2.7	Earthen dam				
(a)	Length of right earthen dam (m)		1190	667	240
(b)	Length of left earthen dam (m)		2490	957	2911.5
(c)	Top width (m)		8.0	8.0	8.0
(d)	Average NSL Right bank(m)		417.26	395.16	378.84
(e)	Average NSL Left bank(m)		418.9	393.22	359.34
3.0	Link canal				
3.1	Patanpur to Mohanpura				
(a)	Length of canal (km)		55.37		
(b)	Flow		by gravity		
(c)	Type of lining		P.C.C.		
(d)	Full supply level at head (m)		411.0		
(e)	Full supply depth at head(m)		5.0		
(f)	Bed width (m)		19.5		
(g)	Side slope (H:V)		1.5:1		
(h)	Bed slope		1 : 10000		
(i)	Design discharge at head & tail (Cumec)		199.3		
(j)	Total No.of canal structures		39		
	(2 Aqueducts, 1 Tunnel, 3 Hume pipe culverts, 6 Super passages, 2 Drainage syphons, 1 Cross Regulator cum Escape, 6 Head Regulators, 1 Escape, 10 DRB, 6 VRB and 1 Railway bridge)				
(k)	Velocity (m/s)		1.331		
3.2	Mohanpura to Kundaliya				
(a)	Length of canal (km)		73.17		
(b)	Flow		by gravity		
(c)	Type of lining		P.C.C.		
(d)	Full supply level at head (m)		392.0		
(e)	Full supply depth at head (m)		5.0		
(f)	Bed width (m)		21.3		
(g)	Side slope (H:V)		1.5:1		
(h)	Bed slope		1 : 8000		
(i)	Design discharge at head & tail (Cumec)		238.0		
(j)	Total No.of canal structures		44		
	(3 Aqueducts, 2 Tunnels, 8 Hume pipe culverts, 5 Drainage syphons, 2 Super passages, 1 Cross Regulator cum Escape, 5 Head Regulators, 1 Escape, 13 DRB, 4 VRB)				

(k)	Velocity (m/s)		1.502		
3.3	Kundaliya to Rana Pratap Sagar Alt.(a)				
(a)	Length of canal (km)		115.08		
(b)	Flow		by gravity		
(c)	Type of lining		P.C.C.		
(d)	Full supply level at head (m)		368.7		
(e)	Full supply depth at head (m)		4.0		
(f)	Bed width (m)		8.0		
(g)	Side slope (H:V)		1.5:1		
(h)	Bed slope		1:20000		
(i)	Design discharge at head & tail (Cumec)		49.1		
(j)	Total No.of canal structures		73		
	(7 Aqueducts, 2 Tunnels, 21 Hume pipe culverts, 2 Super passages, 4 Drainage syphons, 1 Canal Syphon, 1 Cross Regulator, 10 Head Regulators, 2 Cross Regulator cum Escapes, 2 Escapes, 14 DRB & 7 VRB)				
(k)	Velocity (m/s)		0.752		
3.4	Kundaliya to Gandhi Sagar Alt.(b)-I				
(a)	Length of canal (km)		98.09 (Including pumping reach of 19.38 Km)		
(b)	Flow		involving lift		
(c)	Type of lining		P.C.C.		
(d)	Full supply level at head (m)		412.00		
(e)	Full supply depth at head (m)		3.4		
(f)	Bed width (m)		7.0		
(g)	Side slope (H:V)		1.5:1		
(h)	Bed slope		1:10000		
(i)	Design discharge at head & tail (Cumec)		49.1		
(j)	Total No.of canal structures		61		
	(2 Aqueducts, 7 Hume pipe culverts, 1 Super passage, 12 Drainage syphons, 1 Barrage, 12 Head Regulators, 2 Cross Regulator cum Escapes, 2 Escapes, 9 DRB , 12 VRB & 1 Railway Bridge)				
(k)	Velocity (m/s)		1.07		
3.5	Kundaliya to Gandhi Sagar Alt.(b)-II				
(a)	Length of canal (km)		73.29 (Including pumping reach of 3.20 km and Barrage portion of 0.96 km.)		
(b)	Flow		involving lift		
(c)	Type of lining		P.C.C.		

(d)	Full supply level at head (m)		368.7		
(e)	Full supply depth at head (m)		3.5		
(f)	Bed width (m)		9.0		
(g)	Side slope (H:V)		1.5:1		
(h)	Bed slope		1:13500		
(i)	Design discharge at head & tail (Cumec)		49.1		
(j)	Total No.of canal structures		50		
(2 Aqueducts, 1 Tunnel, 9 Hume pipe culverts, 3 Super passages, 7 Drainage syphons, 1 Barrage, 12 Head Regulators, 1 Cross Regulator cum Escape, 1 Escape, 5 DRB, 7 VRB & 1 Railway Bridge)					
(k)	Velocity (m/s)		0.861		
4.0	Pumping system		Alt.(a)	Alt.(b)-I	Alt.(b)-II
			(No pumping)	(Three stage pumping)	(Single stage pumping)
(a)	Ist stage pumping RL (m)		-	368.35 to 385.00	356.56 to 404.00
(b)	IIInd stage pumping RL (m)		-	379.50 to 395.00	-
(c)	IIIrd stage pumping RL (m)		-	394.00 to 412.00	-
(d)	No. of Pumps		-	21	7
(e)	Av. Discharge per pipe (taking 6 pipe lines)		-	7.43 cumec	6.0 cumec
(f)	Total design head (m)		-	59.07	62.41
(g)	Capacity of Pumps				
	Ist stage pumping (H.P.)		-	2150	5000
	IIInd stage pumping (H.P.)		-	1750	-
	IIIrd stage pumping (H.P.)		-	2000	-
(h)	Total electric power required for pumping (MW)		-	22.38	18.1
(i)	Diameter of pipes (m)		-	2.4	2.1
(j)	Length of pumping reach (km)		-	19.74*	3.2
* (1.55 km pipe line, 17.55 km canal & 0.64 km Res. Length)					
5.0	Utilisation of water		Alt.(a)	Alt.(b)-I	Alt.(b)-II
	Total water utilization (Mm ³)		1325.0	1368.0	1360.0
6.0	Details of seven dams proposed in Upper Chambal sub-basin				
			Live storage (Mm3)		Annual irrigation (ha)
(a)	Major projects				
	i) Chitabad dam		200.0		52957.0

	ii) Sonechiri dam		52.0		14359.0
	iii) Padunia dam		42.0		11881.0
	iv) Sewarkheri dam		37.0		10066.0
	v) Sekri Sultanpura dam		36.0		10232.0
(b)	Medium projects				
	i) Ramwasa dam		21.25		5778.0
	ii) Bachora dam		15.0		4127.0
7.0	Annual irrigation (ha)		Alt.(a)	Alt.(b)-I	Alt.(b)-II
(a)	Enroute		108739.0	118860.0	117253.0
(b)	Upper Chambal		109400.0	109400.0	109400.0
(c)	Ex- Kota barrage		2150.0	2150.0	2150.0
	Total		220289.0	230410.0	228803.0
8.0	Estimated cost at 2002-03 price level (Rs. in lakh)				
(a)	Head works		112356.41	112356.41	112356.41
(b)	Canal & Canalisation including pumping station		186546.54	200190.36	193473.29
	Total		298901.95	312546.77	305829.70
9.0	Benefit Cost ratio		1.67	1.59	1.63
10.0	Internal Rate of Return		14%	14%	14%