

Chapter – 3 Interstate Aspects

3.1 Rivers and the Parbati -Kalisindh-Chambal link

The Chambal river is an interstate river with a catchment area of 1,32,508 sqkm covering parts of Madhya Pradesh, Rajasthan and Uttar Pradesh. River Chambal rises from the Vindhyan ranges near Mhow in the Indore district of Madhya Pradesh. It is the largest tributary of the Yamuna. It joins the Yamuna River near village Sahore of the Etawah district after traversing a distance of 960 km. It flows through three States namely Madhya Pradesh, Rajasthan and Uttar Pradesh.

Parbati River: The Parbati River is the third largest tributary of Chambal River flowing through Madhya Pradesh and Rajasthan. It originates from Vindhyan ranges near Astha in Sehore district of M.P. at an elevation of 609 m and joins river Chambal in Kota district of Rajasthan. The total length of river is 436 km. The total catchment area of Parbati sub basin is 15,861 sqkm (11.96 % of catchment area of Chambal basin). Initially for a length of 162 km in Madhya Pradesh, the river traverses north-easterly course and in the balance 60 km in north-westerly course. The river then forms common boundary between Madhya Pradesh and Rajasthan for next 50 km before entering the Kota district of Rajasthan. It then traverses about 107 km before joining the Chambal.

Newaj River: The Newaj River is a left bank tributary of the river Parwan which in turn is a right bank principal tributary of the Kalisindh river. It rises at an elevation of 634 m in Astha tehsil of Sehore district in M.P. and traverses northerly course till it joins the river Parwan in the Jhalawar district. The total length of the river is 220 km, out of which 205 km is in M.P. The catchment area of river Newaj upto confluence with parwan is 4372 sqkm. The catchment area upto Mohanpura dam site is 3594 sqkm.

Kalisindh River: The River Kalisindh is a principal tributary of the Chambal. It originates near Bagli village in the Dewas district of M.P. and joins the river Chambal in the Kota district of Rajasthan. The catchment area of Kalisindh sub-basin is 24663 sqkm (18.61% of total catchment area of Chambal basin). The river rises at an elevation of about 610 m from Barziri hill near village Bagli in Dewas district in M.P. The total length of river is 351 km till it joins Chambal River. The river Kalisindh flows through a length of 180 km in M.P. through Dewas and Shajapur districts and remaining 171 km through Jhalawar and Kota districts of Rajasthan.

The Parbati-Kalisindh-Chambal link Project envisages diversion of surplus water of Parbati, Newaj (a tributary of Kalisindh) and Kalisindh river for enroute irrigation and other uses through link canal and to the Gandhi Sagar or Rana Pratap Sagar reservoir built across river Chambal for irrigation in the drought prone area of upper Chambal sub-basin through substitution. The link canal will traverse through Madhya Pradesh and Rajasthan states.

3.2 Inter state agreement on sharing of Chambal water

As per the agreement reached between Government of Madhya Pradesh and Government of Rajasthan on sharing of the Chambal water, 3847 Mm³ of water is committed from the Gandhi Sagar dam to meet the requirements of hydropower generation at Gandhi Sagar, Rana Pratap Sagar and Jawahar Sagar and for annual irrigation of 5,66,801 ha in the commands of the right main canal and the left main canal of the Kota barrage. The water requirement for hydro-power at Gandhi Sagar is assessed to be 584 Mm³. The balance down stream committed use works out as 3363 Mm³. The data on releases to Gandhi Sagar power house for the period 1960-83 have been obtained. It is seen that the average annual releases during 1960-83 is 3758 Mm³ against the committed use of 3363 Mm³. The agreement between Madhya Pradesh and Rajasthan has been reached on dated 16th March 1961 for sharing of cost between two participating States. As per another agreement reached between Madhya Pradesh and Rajasthan in Kota on 17th and 18th October 1977 between the Chief Engineer, Chambal Betwa, M.P. and Additional Chief Engineer, C.A.D., Chambal during discussion regarding World Bank Programme of Chambal Ayacut, the water from Chambal reservoirs is to be shared on 50:50 basis.

3.3 Water Availability

The preliminary water balance studies of Parbati sub-basin upto Patanpur dam site, Newaj sub-basin upto Mohanpura dam site and Kalisindh sub-basin upto Kundaliya dam site were carried out by NWDA and accepted by the TAC of NWDA.

The water yield series at Patanpur dam site on Parbati river and Kundaliya dam site across Kalisindh river have been revised in accordance with the TAC guidelines considering latest available data and 75% dependable yields at above sites have been worked out and adopted in the report.

In the above studies, the surface water balances at various diversion points have been worked out taking into account 75% dep. water yield considering in-basin water needs for irrigation, domestic & industrial uses, hydropower generation and regeneration into streams upto 2050 AD. The provision of import & export, if any, upto each diversion point have been kept intact. The revised water yields at 75% and 50% dependabilities and water balance at above dam sites are furnished in Table 3.1 below.

Table – 3.1
Water balance at diversion points

Diversion point	Yield at (Mm ³)		Water balance at (Mm ³)	
	75% Dep.	50% Dep.	75% Dep.	50% Dep.
Patanpur (Parbati)	1934	2370	948	1384
Mohanpua (Newaj)	862	1266	444	848
Kundaliya (Kalisindh)	1278	1827	610	1159
Total	4074	5463	2002	3391

Out of 2002 Mm³ total surface water balance available at various diversion points at 75% dependability, about 1360 Mm³ of water is proposed to be diverted at 75% dependability through Parbati-Kalisindh-Chambal link project.

3.4 Submergence

Three reservoirs; Patanpur on river Parbati, Mohanpura on river Newaj and Kundaliya on river Kalisindh are proposed. The total area under submergence of Patanpur reservoir at FRL 419 m is assessed as 2998 ha. The entire submergence area lies in Madhya Pradesh. About 22 villages will come under submergence of Patanpur reservoir. Similarly, the entire submergence area of Mohanpura reservoir spreading over 2510 ha lies in Madhya Pradesh. All the 8 villages likely to be affected are in the Rajgarh district. The submergence area of Kundaliya reservoir spreading over an area of 11800 ha lies in Madhya Pradesh. Out of 35 Nos. of villages to be affected, 15 Nos. are in Rajgarh district while 20 Nos. lies in the Shajapur district. As the entire submergence area of all three reservoirs lies in Madhya Pradesh, a majority of the oustees would be settled in Madhya Pradesh.

3.5 Irrigation benefits

The P-K-C link canal has three reaches as mentioned in Chapter 'Introduction'. The entire irrigation, domestic use and transmission losses for each reach have been worked out for all the alignments including their alternatives. The enroute irrigation and domestic use of water will be in the areas falling in the districts of Rajgarh, Guna, Shajapur, Mandsaur, Morena/Bhind in Madhya Pradesh and Jhalawar, Kota and Chittorgarh in Rajasthan. Considering the linking to Rana Pratap Sagar i.e. alternative-(a), an area of 65,657 ha will be benefitted by irrigation in Madhya Pradesh and 43,082 ha in Rajasthan enroute. Thus, the link shall be providing irrigation benefits to total area of 1,08,739 ha enroute. In case of linking to Gandhi Sagar, the benefit has been worked out for both the alternative i.e. (b)-I and (b)-II. Adopting the alternative-(b)-I, Irrigation benefits will be 1,18,860 ha (93,649 ha in M.P. and 25,211 ha in Rajasthan) while for alternative-(b)-II, the irrigation benefits will cover an area of 1,17,253 ha (90,474 ha in M.P. and 26,779 ha in Rajasthan).

In addition to above, 663 Mm³ of transferred water will be utilised in upper Chambal sub-basin to irrigate an area of 1,09,400 ha. through seven proposed projects in Madhya Pradesh. 13 Mm³ of water will be utilised through existing Kota barrage to irrigate an area of 2150 ha in Bhind & Morena districts of M.P.

3.6 Need for fresh interstate agreements

The transferred water of Parbati, Newaj and Kalisindh rivers to Chambal to be utilised on substitution basis through seven proposed projects in upper reaches of Chambal basin would provide irrigation to an area of 1,09,400 ha. The catchment area of river Parbati upto Patanpur, Newaj upto Mohanpura and Kalisindh upto Kundaliya lies in the Madhya Pradesh. Therefore, entire balance water available at these sites is contributed by the catchment area falling in Madhya Pradesh. However, the state wise utilisation of balance water/transferred water is given in Table 3.2.

Table 3.2
State wise breakup of utilisation of water (in Mm³)

Reach	State	Utilisation of water for		Transmission losses	Total
		Irrigation	Domestic		
Enroute					
Alt (a)	Madhya Pradesh	325	6	66	397
	Rajasthan	213	8	31	252
Alt (b)-I	Madhya Pradesh	464	6	70	540
	Rajasthan	125	7	20	152
Alt (b)-II	Madhya Pradesh	448	6	70	524
	Rajasthan	133	7	20	160
Upper Chambal sub- basin	Madhya Pradesh	663	--	--	663
Through existing Kota barrage		13	--	--	13
Total					
Alt (a)	Madhya Pradesh	1001	6	66	1073
	Rajasthan	213	8	31	252
Alt (b)-I	Madhya Pradesh	1140	6	70	1216
	Rajasthan	125	7	20	152
Alt (b)-II	Madhya Pradesh	1124	6	70	1200
	Rajasthan	133	7	20	160

Therefore, 1073 Mm³ (80.98%) of water is proposed to be utilised in Madhya Pradesh and 252 Mm³ (19.02%) in Rajasthan in case of linking to Rana Pratap Sagar whereas 1216 Mm³ (88.89%) of water in M.P. and 152 Mm³ (11.11%) in Rajasthan in case of alternative- (b)-I or 1200 Mm³ (88.24%) of water in M.P. and 160 Mm³ (11.76%) of water in Rajasthan in case of alternative-(b)-II is proposed to be utilized in case of linking to Gandhi Sagar. 663 Mm³ of water will be tapped in the proposed projects in the upper Chambal sub-basin for irrigation of 1,09,400 ha. of area. The water tapped in the upper reaches of proposed projects will be utilised in the Madhya Pradesh. By tapping the water in the upper reaches of Chambal, the inflow at Gandhi Sagar will be reduced. In case of linking to G.S. this reduction in inflow at Gandhi Sagar will be supplemented by transferring the equivalent water at Gandhi Sagar dam through Parbati-Kalisindh- Chambal link project. Thus, the power generation at Gandhi Sagar, Rana Pratap Sagar and Jawahar Sagar will not be affected. While in case of linking to Rana Pratap Sagar dam, Alt (a), the reduction in inflow at Gandhi Sagar dam would not be supplemented through P-K-C link project, thereby, resulting a loss of power of about 6 MW at Gandhi Sagar dam.

Since, the water is proposed to be transferred from the area of Madhya Pradesh benefiting the Rajasthan state also in terms of irrigation & domestic water supply, a fresh interstate agreement between Madhya Pradesh and Rajasthan will be required on the above aspect for sharing the cost and benefits of the project.