



ICOLD & APG Symposium
on
Sustainable Development of Dams & River Basins



DAMODAR BASIN WATER MANAGEMENT SYSTEM - A review on critical issues and performance

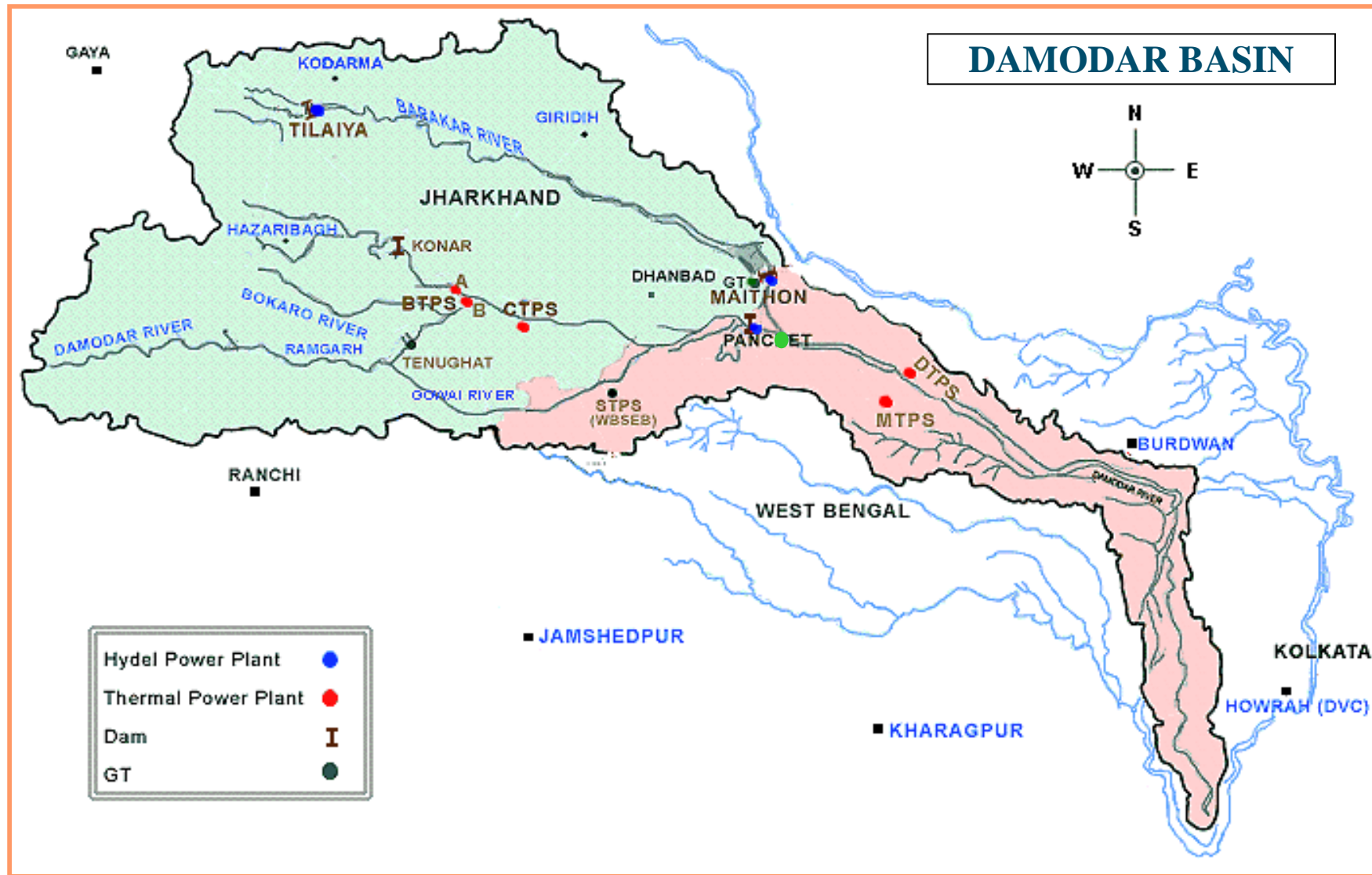
by

SATYABRATA BANERJEE

DAMODAR VALLEY CORPORATION

Executive Director (Civil), satyabrata.banerjee@dvc.gov.in

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DAMODAR RIVER- FLOODS

- A small river of 541 km. length & catchment area 22015 Sq-Km, was errant and often destructive due to its devastating floods, became a subject of myths, fables and rhymes for children in Bengal.
- **‘Sorrow of Bengal’** – attached to the river
- Major floods recorded in years - 1823, 1840, 1877, 1913, 1935, 1939 & 1941, 1943.
- Flood peaks Generated – 6.5 lac. cusec or more
- A moderate flood of 1943 of peak inflow 3.5 lac cusec - resulted inundation of Burdwan and destruction of 70 villages and 18,000 houses. Calcutta was disconnected from outer world for about 10 weeks. No movements of arms ammunitions and army from Calcutta to war front. Total damage – estimated to be around Rs. 8 crores.

BIRTH OF DVC

- Govt. of Bengal - set up ‘**Damodar Flood Enquiry Committee**’ under the chairmanship of ‘**Maharaja of Burdwan**’. Eminent personality like **Dr. Meghnad Saha** was also a member.
- Committee recommended - for creation of an organisation like Damodar Valley Authority (later on - Corporation) in line of Tennessee Valley Authority of USA.
- Central Technical and Power Board appointed – Mr. W.L.Voorduin, an expert from TVA – for preparation of report. In 1945 – Mr. Voorduin submitted- ‘***Preliminary Memorandum on the Unified Development of the Damodar River***’.
- Mr. Voorduin’s recommendations were finally accepted by the CTPB and the states of W. Bengal & Bihar.
- **On 7 July, 1948**, DVC came into being consequent upon passing of DVC bill by Central legislature.

DVC : PRIME OBJECTIVES

- Promotion and operation of schemes for irrigation, water supply and drainage.
- Promotion and operation of schemes for the Generation, Transmission and distribution of electrical energy, both hydro-electric and thermal.
- Promotion and operation of schemes for flood control in the Damodar River and its tributaries.
- Promotion and control of navigation in the Damodar river and its tributaries and channels if any.
- Promotion of afforestation and control of soil erosion in the valley.
- promotion of public health and the agricultural, industrial, economic and general well being in the Damodar Valley and its area of operation.

DAMODAR VALLEY CORPORATION

- An Autonomous Body of Central Govt. and the state Governments of West Bengal & Bihar (now Jharkhand) was created.
- It was the first multipurpose integrated River Valley Project of independent India with prime objectives of flood control, irrigation, municipal & industrial supply of water, power generation & distribution, socio-economic development of valley area, environmental protection etc.
- DVC came into existence on 7th July' 1948 by an Act of Parliament '**DVC ACT (XIV), 1948**'.

PROJECT IMPLEMENTATION:

Total scheme was divided into two phases for implementation :

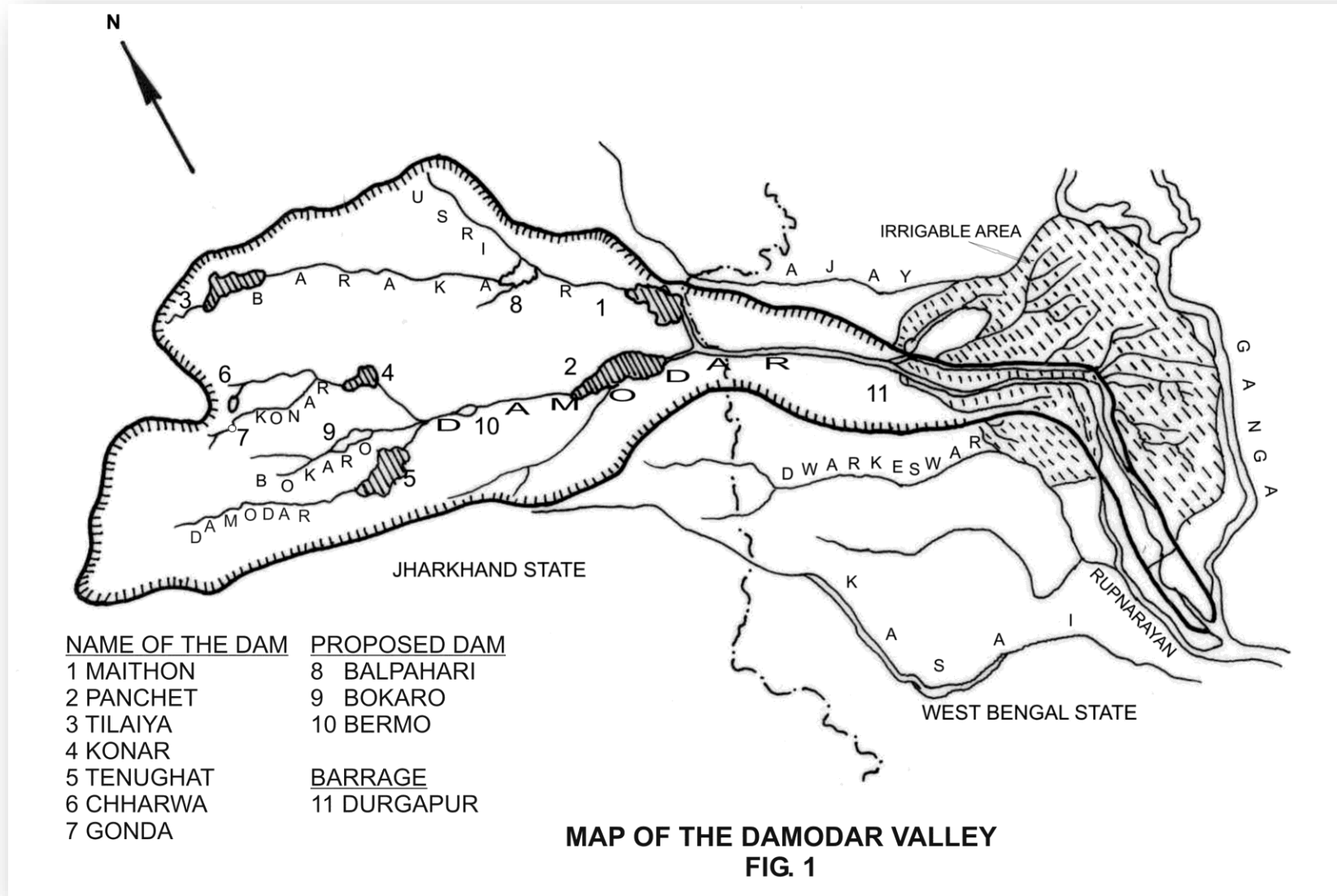
- **Phase I -**

- Four dams at Maithon, Panchet, Tilaiya and Konar with hydel stations.
- A Barrage at Durgapur with Canal Systems.
- Bokaro thermal power station with transmission and distribution system.

- **Phase-II –**

- Remaining four dams at Aiyar, Deolbari, Bokaro & Bermo.

- **Construction of 4 Dams, barrage & a canal system under Phase-I were completed by 1959.**



RESERVOIR STORAGE AND FLOOD MODERATION

	Flood Storage	Live Storage	Total Storage	Flood Moderation Capacity	
				Combined Peak Inflow	Moderated Outflow
	Million Acre-Feet (MCM)			Cusec (Cumec)	
Original Plan	2.915 (3579)	2.30 (2838)	5.680 (7009)	10.0 lac (28321)	2.5 lac (7085)
1 st Stage of DVC Dams	1.510 (1851)	0.98 (1209)	2.900 (3578)	6.5 lac (18420)	2.5 lac (7085)
With Non-Acquisition of Land	1.047 (1206)	0.98 (1209)	2.437 (3007)	6.0 lac (17003)	2.5 lac (7085)
Current position	0.786 (971)	0.75 (926)	1.788 (2206)	5.0 lac (14169)	2.5 lac (7085)

FLOOD MODERATION THROUGH DVC DAMS

Period	Combined Peak Inflow (in Cusec)	Combined Peak Outflow (in Cusec)	Flood Moderation (in Cusec)
Oct' 1959	6,23,000	2,88,000	3,35,000
Oct' 1961	5,16,000	1,60,000	3,56,000
Oct' 1973	5,88,000	1,75,000	4,13,000
Sept' 1978	7,74,000	1,63,000	6,11,000
Sept' 1995	6,19,000	2,50,000	3,69,000

Note: If the 1978 flood was allowed to pass without any moderation from DVC dams, It would have generated a flood peak of **11,80,000 cusec** at Durgapur Barrage, which is more than the total design flood of DVC system i.e. 10,00,000 cusec and a total devastation in the densely populated lower Damodar area could not be avoided.

WATER SUPPLY & POWER GENERATION IN DVC:

❑ Water Supply For Irrigation:

3 crops in a year- Kharif, Rabi & Summer crop Boro from DVC water.

1000 to 1200 MCM water - for Kharif Irrigation

86 MCM of water - for Rabi Irrigation

200 to 400 MCM of water - for non-committed Boro Irrigation

❑ Water Supply For Municipal & Industrial Purposes:

Supplying water to **158 Municipal & Industrial agencies** from Ranchi to Panagarh.

Main Industrial consumers - Steel plants, Thermal plants, Railways, Collieries & Washeries, Fertilizer Plants etc.

Main Domestic Consumers – Jharia Water Board Dhanbad City, Asansol, Ranigunge & Durgapur Municipalities etc.

WATER SUPPLY & POWER GENERATION IN DVC:

❑ **Hydel Power Generation in DVC:**

Total Capacity: **147.2 MW**

Maithon - 63.2 MW

Panchet - 80 MW

Tilaiya - 4MW

❑ **Thermal Power Generation in DVC:**

Total Installed Capacity: **7079 MW**

CRITISISM OF DVC - ISSUES:

❑ **Man Made Flood by DVC:**

DVC often criticised for creating man made flood in Lower Damodar areas, which is not correct due to constraints below:

- **Inadequate storage capacities in DVC reservoirs**
- **Drastic reduction in Lower Damodar Channel capacity**
- **Tidal effect and sedimentation of channels at outfalls**
- **Tenughat dam- non-inclusion in DVC's unified operation of reservoirs.**
- **Uncontrolled catchment below Maithon & Panchet dams**

CRITISISM OF DVC - ISSUES:

❑ **Release of Flood Without Intimation:**

DVC is often criticised that flood water is released without prior intimation, which is absolutely incorrect due to the reasons below:

- **DVC dams are operated by a Committee, DVRRC, where the Chief Engineer, GoWB is also a member.**
- **Flood warnings are issued to all concerned 6 hours before the flood release from dams.**
- **DVC website continuously display the magnitude of release and time to reach at different places at lower Damodar area round the clock.**
- **All data are sent to GoWB in real time basis in their control room at Kolkata.**

CRITISISM OF DVC - ISSUES:

❑ **Dredging of DVC Reservoirs:**

DVC is often criticised for taking no action towards dredging of reservoirs for better flood moderation. It is not correct due to following reasons:

- **CWC intimated DVC that dredging of DVC reservoirs are not techno-commercially viable.**
- **Cost of dredging of Maithon & Panchet reservoir to original capacities have been estimated to Rs 11,815 Cr for flood storage area and Rs 50000 Cr for total storage area. Further these expenditures will be of recurring nature.**
- **Life of Maithon & Panchet reservoirs have been extended to 110 years w.r.t. 75 years as envisaged in design considering siltation of full dead storage. This happened due to extensive soil conservation measures taken by DVC in upper catchment since 1950 onwards.**

OTHER CONSTRAINTS:

- Haphazard development & Conflict on different Acts.
- Financial condition of DVC deteriorated due to:
- Enhancement of 5000 MW thermal capacity in last 10-12 years, which affected the water resources sector of DVC also.
- No direct Capital assistance from the stakeholders of DVC since 1969 as per the provision of section - 30 of DVC Act.
- DVC is dealt simply as a power generating unit either during assessment of performance or during imposition of power tariff regulations without considering the other major important mandates of DVC Acts related to water resource management.

STEPS FOR IMPROVEMENT:

- Land acquisition upto MWL in Maithon & Panchet reservoirs.
- Improvement in the drainage condition of Lower Damodar area.
- Augmentation of storage in DVC water system for future needs.
- Creation of flood storage through land acquisition in Tenughat dam upto MWL.
- Rationalisation of use of water for irrigation, municipalities & industries.
- Modernisation of operating system of DVC and regular repair & rehabilitation of dams & all associated components.

CONCLUSIONS:

- The Original objectives behind the creation of the DVC was overall improvement of socio-economic condition of valley area with effective flood control, Irrigation, Supply of water for municipal & Industrial purposes, Hydel & Thermal Power Generation, Soil conservation, afforestation & environmental safeguard of the area.
- However the performance of DVC in last 62 years with only **36% capacity**, with respect to the original plan can not be ignored, as it has been successfully able to delete the tag ‘Sorrow of Bengal’ attached to the river Damodar and in addition to that helped Nadia-Hoogli-Burdwan area of West Bengal to become ‘**Rice Bowl of India**’.

CONCLUSIONS:

- So after 62 years of service to the nation, it is now appropriate to review the extent to which the objectives have been attained through DVC, considering its functioning under limited storage capacities, financial criticalities & socio-economic-political constraints, instead of criticizing unnecessarily without going into the actual facts & figures.
- DVC also desperately needs a full support administratively, technologically & financially from its stakeholders to provide the maximum socio-economic benefits to the people from this year old pioneer river valley project of the country.



THANK YOU