



## **River Valley Project and the Developmental Deficiencies in Maithon Reservoir, Bathanbari, West Bardhaman, West Bengal, India**

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### **Author's contribution**

*The sole author designed, analyzed and interpreted and prepared the manuscript.*

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### **ABSTRACT**

Dams and reservoirs often facilitate the high economic gain in lieu of prolonged initial societal pain. Prevailing ecosystems be it in the minor pool, land, grassland, forest or built up do face the extremity of consequences. Developmental initiatives, which generally modify surficial form and often geared the risk of vulnerability, may not be able to alter the socio-economic status in its very vicinity. Miseries do prevail among the commoners despite the utmost (may or may not be the all-round) endeavour from the government sectors. Sometimes they may either have to share the destinies of developmental refuges or mere onlookers. Lack of consciousness, the apathy of self-introduction from the benefit of government and non-government project retards them from effective harvesting. Their own inabilities of attachment discourage themselves to be intact with these. This write up is a glimpse on the development of Maithon Reservoir on one of the tributaries of the once 'River of Sorrows' the Damodar under Damodar Valley Corporation (DVC), a multipurpose river valley project and its consequences on the life and livelihood pattern of this nearby village community.

*Keywords: DVC; reservoir; socio-economic; upliftment; imbalance.*

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## 1. INTRODUCTION

Indian villages are the busy rendezvous of simplicity, unity and antiquity. These are the Elysium of rustic men and women with their original inherited cultural traits. Poverty laded remote villages like Bathanbari only expect minimum support due to developmental destinies in the wake of dam construction by huge economic, social and environmental cost instead of sincere assistance from the external sources. Although this type of construction is a prerequisite to feed the teeming millions but often lay lacuna for further development. Particular objective based selective schemes may only help them a lot to remove the imbalances between the good and evil and the rich and poor. Formal education system may help to strengthen their solid footing in the economic arena. Again primary health facilities in the time of need and public health facilities and awareness programme against the diseases like leprosy, malaria, night blindness, filaria, etc. may assure them good health.

Once, the 'River of Sorrows', the Damodar river flows from the Palamau hills of Chotanagpur Plateau of Jharkhand state at an elevation of 610 metres above mean sea level. Originating from the source, the river follows firstly to the southeasterly direction and again abruptly changes its course to southerly direction covering altogether nearly 600 kilometres. The upper valley encompasses fully the six districts of Bokaro, Chatra, Dhanbad, Giridih, Hazaribagh, Koderma and partially three districts of Dumka, Palamau and Ranchi of Jharkhand state. Lower catchment areas surround fully two districts of East Bardhaman and Hooghly and partially three districts of Bankura, Howrah and Puruliya districts covering 25000 square kilometres of basin areas of West Bengal.

Six major tributaries feed the Damodar. Of these, the Barakar contributes the major water supply to the main river. Excessive rain in the catchment areas often causes a seasonal flood of these rivers. The reason is also triggered by the high erosion proneness of the Upper Damodar Valley due to the high slope and mass destruction of forest for the sake of minerals of many kinds [1]. Again, "When the lands are tilled and when there is no vegetation, then the soil becomes entirely exposed to water and wind actions. The removal of soils is hastened" [2]. The river had a long continuous history of devastating floods of 1730, 1823, 1848, 1856, 1882, 1898, 1901, 1916,

1923, 1935 and 1943. The devastating flood of 1943 had moved the administration of the Government of Bengal to appoint a committee for enquiry and way out. The "Damodar Flood Enquiry Committee" included the members of the then Maharaja of Burdwan and noted scientist Dr. Meghnad Saha. The committee had suggested the formulation of similar authority as that of the TVA, USA and favoured the construction of dams and reservoirs. The flood of 1943 in July of medium magnitude upset the widespread areas of the Damodar Basin. The public life, roads and other civic amenity supply routes were badly damaged. Apart from the Damodar, many rivers overflowed their banks during those days of distress.

Due to the worsening condition of the flood of 1943 and having age-long history of frequent recorded flooding phenomena since the 16<sup>th</sup> century, the Government of India invited an expert Mr. V.L. Voorduin of the Tennessee Valley Authority (TVA) of the U.S.A. As per his positive recommendation, the Government of India constituted "Central Technical Power Board" to analyze the proposal. With due clearance the noted engineer submitted "Preliminary Memorandum on the unified Development of the Damodar River (1945)" and construction of multipurpose dams in the valleys were undertaken to minimize the risk of flood hazard and to use the water for various purposes. Central Government and Governments of Bihar and Bengal states were agreed in April 1947 that the framework would be formulated in the manner of TVA. The Damodar Valley Corporation (DVC) was set up on July 7, 1948 to fulfil the project. Dams were constructed at Tilaiya (1953), Konar (1955), Maithon (1957) and Panchet (1959) to control the ever destructive Damodar River.

### 1.1 Aims and Objectives of the Study

The present study aims at

- i. To establish a relationship between the developmental activities of the Damodar Valley Corporation Project and livelihood pattern of the reservoir village.
- ii. To analyze the cost-benefit ratio in the lines of mitigating the basic requirements of the village.
- iii. To point out the technical lacunae prevailing in the field of upliftment process. and

- iv. To prepare feasibility report to overcome the present socio – economic set back.

## 2. MATERIALS AND METHODS

The hitherto untamed and disastrous flood prone Damodar River with these numerous tributaries and thereafter the initiation of Multipurpose River Valley Project on it and its consequences provide the basic impetus for this study. Such kinds of developmental endeavour have unearthed a multitude of lacuna such as hammering on the prevailing pristine environment, incidence of forced migration etc. in its manifolds of development. The highly affected man and environment is the thrust area of the present depiction. Developmental loopholes and the curative measures through Social Integration Programme afford the impulsion to undertake such endeavour.

Socio-economic updates are best suited with studying through direct questionnaire method. The door-to-door household survey techniques on 139 families including 42 aboriginals in N.23°48'30" and E.86°50'00" juncture have revealed a concrete outline. The Survey of India Topographical Map Nos.73 I/10 and 73 I/14 and time to time reports of Social Integration Programme by DVC have contributed much in this arena. QGIS software employed while preparing the base map of the study area. Owing to the greater importance of this valley area having enormous deposits of coal, minerals of various kinds, this valley itself represents a unique unit for the entire study. Census data from State Census and the DVC map with the project sites on the respective tributaries of the Damodar were imported and utilized for the fulfilment of this research work.

## 3. AN ACCOUNT OF THE STUDY AREA

India is the land of rivers. However, the untamed, erratic and ruinous rivers often cause havoc besides providing blessings of freshwater and fertile silt deposits. Again, irrigation is the prime requisite to feed the ballooning millions through primary economic activities from both pre-independence and post-independence period. The construction event of DVC (Damodar Valley Corporation) was responsible for submergence of 26176 acres of various categories of land affecting nine villages fully and seventy-seven villages partially! DVC was the first of its kind in free India. This multipurpose river valley project encompasses a command area of more than

24,200 square kilometres of the entire districts of Dhanbad and Bokaro of Jharkhand state with other parts. In West Bengal state, it partially covers the districts of Bankura, Puruliya, East and West Bardhaman, Hooghly and Howrah in its upper and lower reaches (Fig. 1). The rocky terrain, hilly highs and splendid reservoir dotted islanded landscape constitute the unique features to prepare a report of such annexed undernourished and ill-connected village, Bathanbari, where the pool always exerts a pull effect of sustenance to the nearby villages in this Mothers Abode (*Mai-ka-sthan* of Goddess Durga or Ma Kalyaneswari).

**Geology:** Maithon reservoir area is the easternmost continuation of the Chotanagpur Plateau. It is a stony and regolith enriched residual hilly area with occasional upstanding. The Damodar valley "... *trough contains resistant rocks of Upper Gondwana, the relief rivals and sometimes exceeds that of the adjacent gneissic landscape*" [3]. Harder rock strata, cracks, joints, and these alignments constitute geologic structure and shaping of topographic variations.

**Climate:** Maithon experiences the extreme climatic events where mercury falls below 5°C in winter and crosses the limit of 40°C in summer. Monsoon showers its blessings for a full spell of three months.

**Vegetation:** Geology and relief greatly influence the floral and faunal characteristics. Creepers are abundant with many deciduous tree varieties. Undergrowth is rampant with flowering plant species. Monoculture quick growing woody floral types constitute the ornamental decoration of the village roads. The regolith enriched sandy soil cover of the Bathanbari locality is fit for vegetables and millet production.

The projected landmass of the Bathanbari village in the vicinity of the reservoir shows a peculiar site with reference to the inter-state cross boundary location. It is a wet point foothill settlement of linear pattern. Having been situated in N. 23°48'30" and E. 86°50'00" is the fortunate untouched site in the wake of dam construction (Fig. 2).

Bathanbari village (N.23°48'30" and E.86°50'00") is a rural complex of 139 households having set up of 42 aboriginals (Table 1). Agriculture is the mainstay of the economy. Almost everyone possesses holdings to meet their prime needs.

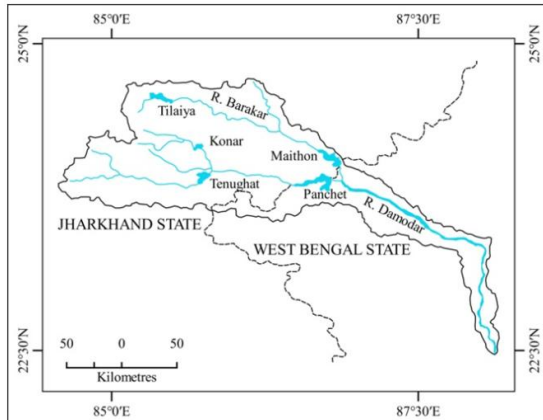


Fig. 1. Dams and reservoirs of the DVC

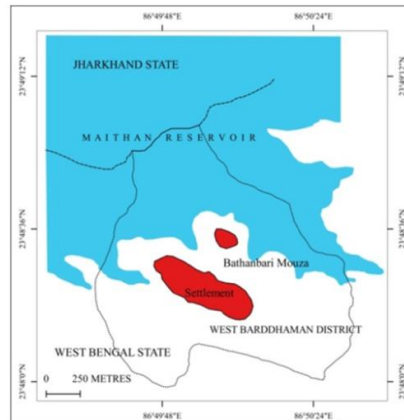


Fig. 2. Location of the study area

Table 1. Demographic structure of the village, 2011

| Particulars       | Total               | Male   | Female |
|-------------------|---------------------|--------|--------|
| Population        | 941(139 households) | 493    | 448    |
| Child (0-6 years) | 110                 | 57     | 53     |
| Scheduled caste   | 0                   | 0      | 0      |
| Scheduled tribe   | 345 (36.66%)        | 167    | 178    |
| Literacy          | 69.43%              | 82.57% | 54.94% |
| Total worker      | 280                 | 251    | 29     |
| Main worker       | 185 (66.07%)        | 0      | 0      |
| Marginal worker   | 95 (33.93%)         | 85     | 10     |

Source: State Census, 2011

Well irrigation is rampant in these areas. Paddy, sugarcane, potatoes, cabbages, caulis-flower, brinjal, peas and oranges are produced. Apart from it, men are engaged in boating activities, fishing, business etc. and women find space in office works in certain cases.

Duck farming, handicraft works have also been practised. Bicycle is the main means of transportation. Motorcycle is most favourable mode. There is very meager count of four wheelers.

Semi-concrete and concrete buildings are prevalent now a day. In earlier days, localized raw materials were often been used for housing purposes. It is worth mentioning that the houses do often reflect the imprints of economic set up of the inhabitants. Having been located near such a gigantic sweet water source, the drinking water supply is not sufficient yet. Hospital is far away and it is hardly accessible in the period of crisis due to inadequate facilities in number and modes of transport and communication. Educational infrastructure is confined in a primary school, which symbolizes literacy campaign in their village. ICDS centers may grow eagerness

towards modern education system in such areas of educational impoverishment.

#### 4. LESSON FROM THE PROJECT

Multipurpose River Valley Projects by these dams and sluices often cause multitudes of disruption in free channel flow as well as in the total hydraulic and thermodynamic condition of the river. It also affects the water quality in the channel by slow down of flow and amount and by permanent or temporary water stagnations. It also inhibits the free flow of fishes and other aquatic lives. Moreover, loss of land in the event of dam construction may only be substituted with huge sustainability attainment.

Although, "There is a growing concern that dam projects cause irreversible environment change, which are often complex, multiple, and essentially negative" [4]. In this Multipurpose River Valley Project, irrigation, supply of water for drinking and industrial purposes and for municipal uses, navigation, pisciculture as well as power generation project were undertaken to meet the needs of the local as well as the adjoining areas. Like the other water

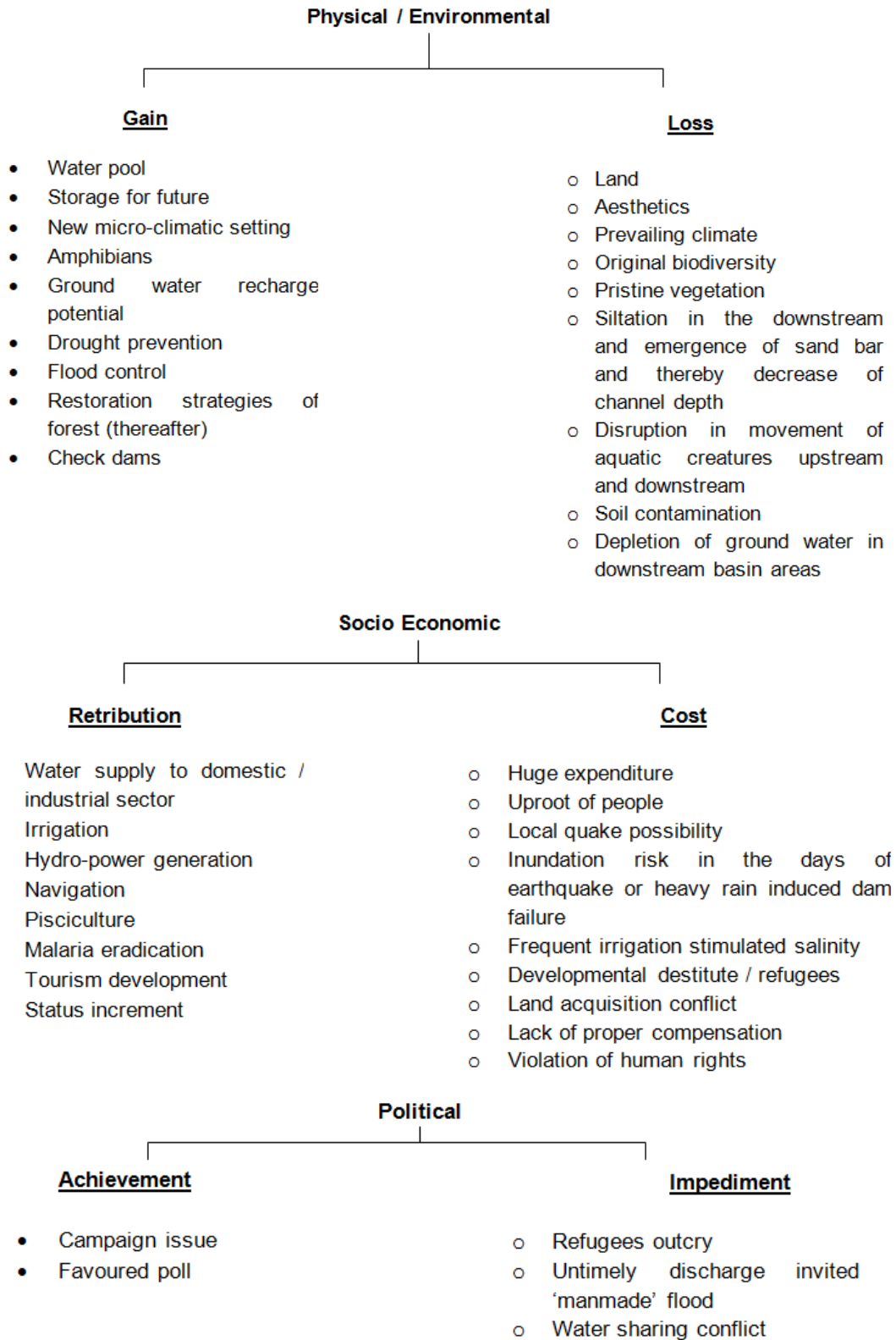
management plan, Maithon Reservoir work is being regarded as the integral part of the Social Integration Programme (SIP). Apart from maintaining the health facilities and civic amenities, self-employment generation, agricultural input, infrastructural facilities, sports and entertainment, social forestry, soil conservation, flood plain zoning and flood proofing measures were also undertaken for overall development of the area [5]. Considerable land erosion in the upper reaches was a regular phenomenon. An overall management process was to be done to arrest the infinite loss. Damodar Valley Corporation is oriented to check and to make a way out in this respect. The fertile silt covered organic matter enriched soil is highly positive to augment the ever-growing demand of food supply for the millions of people inhabiting in this catchment areas.

Moreover, other civic amenities through "Social Integration Programme" of 1992-1993 (renamed from Social Obligation Programme of 1981) and planned outline of researching new field of work on a localized area basis will provide the key impetus to uplift the overall economic conditions of the people of the rural areas.

DVC project has not yet been demanded full proof to flood although the frequency and magnitude of damage touches the line of paucity from the very opening of the project. At present, Maithon and Panchet reservoirs can combinedly moderate a peak flood of 14169 cumec. The irrigation potential of DVC as West Bengal alone enjoys in *Kharif* (wet season crop) and *Rabi* (dry season crop) seasons are 393763 and 22258 hectares respectively. But the dwindling bank full capacity of various channels often erupt huge flood in its lower reaches owing to less drainage clearance by limited canals. "Carrying more than 50 years of legacy, the existing drainage and flood control system of Damodar Valley Corporation has aggravated a number of hydrogeomorphic problems especially in lower Damodar River Basin, viz. siltation of riverbed and reservoirs, uncontrolled monsoonal stream flow, declining carrying capacity of lower course, drainage congestion, low-magnitude annual floods, channel shifting, de-functioned canals, decay of palaeochannels, decline of groundwater level, and less replenishing of soils with fresh silts" [6]. Therefore, minimum release often causes maximum damage in the flat soil bedded basin districts of East Bardhaman, Hooghly and Howrah. It not only spoils the essence of irrigation and domestic as well as industrial

supply but also cut short the capacity of power generation day by day. Dredging activity is not economically viable as it incurs huge cost. Political controversy is the inevitable fate in the event of inundation due to sudden and untimely discharge. Afforestation programme, cross drainage link may only be helpful to get rid of this flooding hazard. Moreover, the paucity of wetlands as water storage devices in the entire affected areas has failed to catch a greater share of overflow causing disastrous flood effect [7]. Construction of dams and diversion activities often results in the loss of wetlands. "...it is established that dam has both decelerated the inundation frequencies but enhanced shrinking wetland area and thereby wetland started to experience new hydrological paradigm" [8]. In many cases, encroachments into seasonal wetland areas for agricultural practices often induce huge socio-economic unrest. Nevertheless, it is a ray of hope that the recent advance warning system is somewhat a means of lessening the damage against the ever blamed political outcry of 'man-made flood'. "Under the Danish Hydraulic Institute (DHI)/Central Water Commission Collaboration Project, the Damodar Basin as the focus point, computerized mathematical model (NAM S-11) was developed and adopted for Damodar Basin in 1986 which has worked satisfactorily, for example, against the peak level forecast of 2589cumec on 27.08.1987, the actual level achieved was 2534 cumec" [9].

Cost-Benefit Analysis is a sine-qua-non of any major developmental projects. This developmental initiative, which generally modifies superficial form and often geared the risk of vulnerability, may not be able to alter the socio-economic status in its very vicinity. Miseries do prevail among the commoners despite the utmost (may or may not be the all-round) endeavour from the government sectors These ultimately target the mottos of maintenance, rehabilitation, resource generation and sustainability attainment of 3700 affected families and 270000 acres of irrigated land of the lower Damodar basin. "Dam and reservoir development will have an important influence on regional society and economy. The migration of population is caused by project land and reservoir flooding. And the damage of arable lands, houses, and infrastructure will directly impact the migrant's production and living" [10]. The overall analysis of the pain and gain of this project may be viewed as follows:



In India, the National Rehabilitation and Settlement Policy, 2007 may be helpful to outwit many disputes for the betterment of these developmental destitute.

## 5. MEASURES TO IMPROVE THE PEOPLE'S WELFARE

The following measures should be taken to overcome the ongoing deficiencies of the Bathanbari village of Maithon area as follows:

- Safe drinking water supply should be the prime requisite to avoid water-borne diseases and many more related complexities.
- Health facilities are highly in need to fulfil the medical demand of the localities. In absence of this, the mobile clinic may be helpful. Health awareness camp and detection of diseases may help to overcome many national losses.
- Minimum road connectivity with frequent conveyance is highly in need to meet the demand of the hour.
- Generation of works to engage them throughout the year is the means of combating the poverty-laden evil activities.
- Minimum access to amenities is highly in need to nourish the village. The government, as well as non-governmental sincerity, may only mitigate their heaps of not's.

## 6. CONCLUSION

Illiteracy, poverty and ignorance are the major constraints of upheaval in all the spheres of development. Education, health, culture and advancement in all cases are mainly affected by this. Again, cultural limit causes the bottleneck of exposure in the real world. To outwit many more constraints, DVC has launched 'Social Integration Programme' in 1981 as an in-depth developmental commitment to infrastructural and socio-economic sectors of the communities residing within a 10 kilometres radius of this major project. As a growing concern, it enlarges from initially 255 villages and nurtures the pros and cons of 332 villages covering 14 blocks of 4 districts of Jharkhand state and 297 villages in 12 blocks of 3 districts of West Bengal covering nine lakh populations. Mondal, Murundi, Hembram, Kisku, Tudu and other families often do harvest from this programme, and gain momentum through education drives, health awareness

camp, family welfare programme, civic amenities supplement, employment generation by animal husbandry, self involvement, agricultural practice, social forestry programme, lac cultivation, and leaf collection. Such kinds of awareness will act as the impetus in the searching endeavour of other viable means of sustenance which will certainly be a boon to the total socio-economic upheaval of the people.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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