CHAPTER - 3

3.0.0 THE KANGSABATI PROJECT: BENEFITS AND PROBLEMS

Each and every development project is designed to achieve some well defined benefits planned before its implementation. These benefits in most cases generate losses somewhere in the environment directly or indirectly. As river basin is an integrated or open system, dam building dissects this system. Benefits are gained by the people living in the downstream section. The benefits are mainly measured in monetary terms, particularly in cases like the Kangsabati dam, the purpose of which is irrigation and flood control. These benefits in true sense are the results of losses or deprivation experienced in the upstream section of the dam. The major benefits are increased crop yields due to irrigation assurance, reduction in chance of flooding, increased productivity and bringing of most land under cultivation. But the questions most pertinent to this context are that who are beneficiaries and who are losers. The benefits are achieved by the people living nearer the branch canals, the majority of whom are the economically sound high caste people as the field study proves. But the people living nearer the dam and close to main canals do not avail irrigation. Thus inequality is prominent even within the area which was projected to become beneficial. This inequality creates both economic as well as social problems. But more severe problems are submergence of land and forest and displacement of people. These problems are faced by the group of poor indigenous tribal people. Thus Kangsabati dam is a factor of social marginalization of the groups living in the upstream section.
3.1.0 THE PROJECT DESIGN

The Kangsabati Dam was constructed just above the confluence of River Kangsabati and its tributary Kumari. The Dam has been raised over both the rivers and joined subsequently to form a single reservoir. Canals have been constructed on both the banks. The Left Bank Canal in its way meets the River Silabati where a barrage has been constructed and then crosses it to irrigate lands in between river Silabati and river Darakeshwar. In right bank, similar barrages have been constructed over river Bhairabbanki and river Tarapheni to irrigate the lands in Jhargram and Medinipur South Sub-Divisions of Medinipur district.

The Kangsabati project was constructed with two major objectives: 1) irrigation and 2) moderation of flood (Kangsabati CADA 2005: 1). The Dam was designed to provide supplementary irrigation for 25 cm depth of water during kharif season. Provision was also kept for supplying drinking water for the human and cattle consumption as the area is very much susceptible to domestic water crisis during non-monsoon periods. The peak flood discharge at the Dam site is 10,600 cumecs. During monsoon period, 24670 ham. of reservoir space has been kept for moderating the flood including peak flood to minimize damage in the flood plain of the river. This space is utilized for post-monsoon cultivation.

3.1.1 HISTORY OF THE KANGSABATI PROJECT

The necessity of exploring the possibility of major irrigation scheme in a drought prone area of West Bengal to cover the major portion of the district of Bankura and northern part of Medinipur, which constituted an area of scarcity and famine, was felt for a long
time. Investigations to cover this area with major irrigation project were started in pre-Independence period. However, after Independence, a suitable site for Kangsabati Dam was found as per the recommendations of the Government of India. The project was then framed to irrigate an area of 340750 hectare during *kharif* season and 60629 hectare during *rabi* season. In this scheme, there were also provisions for supporting riparian rights for the existing irrigation system from Medinipur ancient canal system which was operated since 1872 to moderate peak flood in the lower valley of this river and to provide drinking water during the time of dry spells. The original estimated cost was Rs. 25.26 crores. Though the project was formally approved by the Government of India in the year 1961-62 (Kangsabati CADA, 2005: 5), but the construction work commenced in March, 1956. In the first phase, a dam was raised over the river Kangsabati. Irrigation started from 1966 on the *kharif* lands in the areas where canal network had been established since then. After that, the dam was completed over Kumari (a right bank tributary of the river Kangsabati) in 1973-74 and both the dams were then connected to form a single reservoir named “Kangsabati Reservoir” (Map No. 3.1). Along with the construction of the dam, canal systems were also constructed to irrigate an area of 318400 hectares. The Left Bank Canal meets the river Silabati at Sulgi, where a barrage has been constructed to irrigate the lands lying between the river Silabati and the river Darakeswar. Similar types of barrages have also been constructed on the river Bhairabbanki and the river Tarapheni to irrigate the agricultural lands of South Sub-Division and Jhargram Sub-Division in the district of Medinipur (Map No. 3.2).
Map No. 3.1
Kagsabati Reservoir and its surroundings

Based upon Police Station map (surveyed: 1917-19) and Toposheet No. 73 I/12, 73 I/16, 73 J/9 and 73 J/13 (surveyed: 1926-27 and 1973-77)

Index

- Mouza boundary with Jurisdiction List Number
- River Kagsabati and its right bank tributary, Kumari
- Kangsabati Reservoir
The region provided certain advantages for the construction of dam. In general, the area is composed of ancient rocks and has been subjected many cycles of uplift and erosion (District Gazetteers, Bankura 1968:35 and Puruliya 1985:11). Again hard and impermeable rock beds (Basu 2000:68) and availability of building materials usually provided a firm ‘anchor’ for selection of dam site. Likewise, because of hardness of rocks and forest cover, the river carries little silt, so that preliminarily siltation was not thought of as a problem at all. Year-
wise fluctuation of flow, seasonal single peaked hydrographic character of river regime and alignment of hills were the other favourable factors worked up for the selection of the dam site.

3.2.0 SALIENT FEATURES OF THE KANGSABATI PROJECT

The Kangsabati project has been designed to fulfill two main purposes: to supply water for irrigation to the command areas and to control flood in the lower reaches of the Kangsabati basin. Generation of electricity was not considered in its plan. The project includes 3626 km² of catchment area, 137 km² of reservoir as storage tank, 3406 km² of command areas with 7500 numbers of main and branch canals. The most important feature of the project is that it has been constructed in an area of undulated topography, problematic in preservation of water resource necessary for an area having a trend of annual flood resulting into crop failure. Another important feature of the project is that it has been established in an area dominated by indigenous poor people, be they farmers or labourers.

3.2.1 CATCHMENT AREA OF THE RIVERS

a. Kangsabati river at dam site : 1657.60 km² (640 sq.miles)
b. Kumari river at dam site : 1968.40 km² (760 sq.miles)
c. Total catchment area at dam site : 3626 km² (1400 sq.miles)
d. Average annual inflow in the reservoir : 2097x10⁶m³ (1.7x10⁶acre feet).
3.2.2 STREAM FLOW

a. Maximum estimated peak flood (combined) : $10.62 \times 10^3$ cumecs (375000 cusecs)
b. Minimum discharge = 0 cumecs (dry river bed)

3.2.3 THE DAM

a. Length of Kangsabati dam, excluding dyke : 4kms (2.5miles)
b. Length of Kangsabati dam, including dyke : 5.2kms 3.25miles)
c. Length of Kumari dam, excluding dyke : 2.4kms (1.5miles)
d. Length of Kumari dam, including dyke : 4.8kms (3miles)
e. Length of intermediate dyke : 0.4kms (0.25miles)
f. Total length of dam, excluding intermediate hillocks: 10.4kms (6.50miles)
g. Total length of dam including intermediate hillocks : 11.3kms (7.00miles)
h. Maximum height of Kangsabati dam : 41.14m (135 feet)
i. Maximum height of Kumari dam : 44.19m (145 feet)
j. Road level on top of the dam : R.L.138.08m. (453.00')
k. Total quantity of earth work :

i. Kangsabati dam : $222 \times 10^6$ cft.

ii. Kumari dam : $140 \times 10^6$ cft.

l. Total quantity of boulders:

i. Kangsabati dam : $24.93 \times 10^6$ cft.

ii. Kumari dam : $20.37 \times 10^6$ cft.

m. Left bank head regulator discharge : 191.93 cumecs (6777.82 cusecs)
n. Right bank head regulator discharge : 79.18 cumecs (2796.16 cusecs).

o. Kangsabati spillway:
   i. Number of radial gate : 11.
      Size : 30' x 33'
   ii. Kangsabati left bank head regulator : 3
      Size : 10' x 13'6''
   iii. Kangsabati right bank head regulator
      Number of vertical gates : 6
      size : 5'6'' x 10'6''.

3.2.4 RESERVOIR

   a. Full Reservoir Level (FRL) : R.L. 134.11m. (440.00')
   b. Dead Storage Level (DSL) : R.L. 120.40m (395.00')
   c. Maximum Water level ever expected: R.L. 153.64m. (445.00')
   d. Storage at full tank level : 1135 x 10^6 cu.m (0.84 x 10^6 acre feet)
   e. Live Storage : 987 x 10^6 cu.m (0.11 x 10^6 acre feet)
   f. Dead storage : 148 x 10^6 cu.m (.02 x 10^6)
   g. Total submerged area with back pressure: 136.62 km^2 (52.75 sq.miles) [Kangsabati 67.34 km^2 (26 sq.miles), Kumari 69.28 km^2 (26.75 sq.miles)]

3.2.5 CANALS

   a. Total length of Main and Branch Canal : 620 km.
   b. Total length of Distributors and Minors : 3000 km.
   c. Total earth work involved : 200 crore feet.
   d. Total stone required : 6 crore feet.
   e. Total number of irrigation canals : 7500
Source: Official Report 2005, Kangsabati Irrigation Department, Mukutmonipur, Bankura.

The main canal systems of the Kangsabati project have shown in Map No. 3.2, and the main arteries of the distribution system that have been already planned for the project with capacities noted against each are given below in Table No. 3.1.

**Table No. – 3.1.**

Main and branch canals of the Kangsabati project

<table>
<thead>
<tr>
<th>KANGSABATI RESERVOIR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Left Bank Feeder Canal</strong></td>
</tr>
<tr>
<td>(Lined) 191.93 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Right Bank Main Canal</strong></td>
</tr>
<tr>
<td>79.18 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Khatra Main Canal</strong></td>
</tr>
<tr>
<td>(partly lined) upper 85.85 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Supur Main Canal</strong></td>
</tr>
<tr>
<td>(lined) 118.85 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Bhairabbundi, Tarapheni Main canal</strong></td>
</tr>
<tr>
<td>65.85 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Khatra Main Canal</strong></td>
</tr>
<tr>
<td>(Lower) 74.75 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Indpur Main Canal</strong></td>
</tr>
<tr>
<td>(lined) 118.85 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Tarapheni South Main Canal</strong></td>
</tr>
<tr>
<td>(north) 65.42 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Medinipur Branch Canal</strong></td>
</tr>
<tr>
<td>36.37 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Goaltore Branch Canal</strong></td>
</tr>
<tr>
<td>9.44 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Garibeta Branch Canal</strong></td>
</tr>
<tr>
<td>60.28 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Simlapal Branch Canal</strong></td>
</tr>
<tr>
<td>11.54 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Bishnupur Branch Canal</strong></td>
</tr>
<tr>
<td>106.50 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Tarapheni South Main Canal</strong></td>
</tr>
<tr>
<td>30.33 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Salboni Branch canal</strong></td>
</tr>
<tr>
<td>8.04 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Keshpur Branch Canal</strong></td>
</tr>
<tr>
<td>2.87 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Ghatal Branch Canal</strong></td>
</tr>
<tr>
<td>38.14 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Kotulpur Branch Canal</strong></td>
</tr>
<tr>
<td>34.27 cumecs</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
3.2.6 IRRIGATION

a. Gross Command area : 5568.50km² (2150sq.miles)
b. Net irrigated area (kharif) : 340753ha. (842,000 acres)
c. Net irrigable area (rabi) : 60729ha. (150,000 acres)
d. Possible extension of irrigable area : 40469ha. (100000 acres)
e. Reclamation of wasteland : 20235ha. (50,000 acres)
f. Districts and Police Stations benefited from irrigation:

<table>
<thead>
<tr>
<th>Districts</th>
<th>Police Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>III) Hugli</td>
<td>i) Goghat</td>
</tr>
</tbody>
</table>

3.2.7 FLOOD CONTROL

Flood reservoir of 2,00,000 acre feet are retained up to 15th October in each year. Maximum flood discharge of 37,5000 cusec is moderated to maximum discharge of 2,25,000 cusecs i.e., curtailment of maximum flood discharge of the river by 40%.
3.3.0 PICKUP BARRAGES

Pick barrages are important parts of irrigation project and have definite roles in irrigation network. The Kangsabati project has four reservoirs or weir, constructed at strategic point of the small tributary rivers, namely, Silabati, Tarapheni, Bhairabbanki and Parang. Water in those reservoir are stored and supplied to targeted areas in a regulated way.

3.3.1 SILABATI RESERVOIR

<table>
<thead>
<tr>
<th>a. Location</th>
<th>Village</th>
<th>Sulgi</th>
</tr>
</thead>
<tbody>
<tr>
<td>P.S.</td>
<td>Taldangra</td>
<td></td>
</tr>
<tr>
<td>District</td>
<td>Bankura</td>
<td></td>
</tr>
<tr>
<td>Latitude</td>
<td>23° 58' N</td>
<td></td>
</tr>
<tr>
<td>Longitude</td>
<td>86° 68' E</td>
<td></td>
</tr>
<tr>
<td>b. Name of the river</td>
<td>Silabati</td>
<td></td>
</tr>
<tr>
<td>c. Live storage</td>
<td>6415.21 h.m.</td>
<td></td>
</tr>
<tr>
<td>d. Dead storage</td>
<td>2165.04 h.m.</td>
<td></td>
</tr>
<tr>
<td>e. Gross storage</td>
<td>8580.25 h.m.</td>
<td></td>
</tr>
<tr>
<td>f. Reservoir Submergence at FRL</td>
<td>1865.27 ha.</td>
<td></td>
</tr>
<tr>
<td>g. Maximum flood discharge</td>
<td>5072 cumecs</td>
<td></td>
</tr>
<tr>
<td>h. Deepest bed level</td>
<td>83.14 m.G.T.S.</td>
<td></td>
</tr>
<tr>
<td>i. F.R.L.</td>
<td>102.00 m.G.T.S.</td>
<td></td>
</tr>
<tr>
<td>j. D.S.L.</td>
<td>96.01 m.G.T.S.</td>
<td></td>
</tr>
<tr>
<td>k. Top of the Dam</td>
<td>106.00 m.G.T.S.</td>
<td></td>
</tr>
<tr>
<td>l. Spillways crest level</td>
<td>22.00 m.G.T.S.</td>
<td></td>
</tr>
<tr>
<td>m. Maximum height of the Dam</td>
<td>22.54 m.G.T.S.</td>
<td></td>
</tr>
<tr>
<td>n. Spillway:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>i) Length</td>
<td>113.00m.</td>
<td></td>
</tr>
</tbody>
</table>
ii) Number of gates : 8
Size : 11.5m x 10.25m.

o. Total length of non-overflow section : 2x 71 m = 142m
p. Total length of earthen portion : 3765m
q. Number of head regulator : One (1) head regulator
r. Length of link canal (lined) : 16.10Km.

3.3.2 TARAPHERI RESERVOIR

a. Location : Village : Baishnabpur
              P.S. : Binpur
              District : Medinipur
              Latitude : 22° 40' 30'' N
              Longitude : 86° 46' 30'' E
b. Name of the river : Tarapheni
c. Live storage : 2289.02 h.m.
d. Dead storage : 623.99 h.m.
e. Gross storage : 2913 h.m.
f. Reservoir submergence at F.R.L. : 427 hectares
g. Maximum flood discharge : 2144 cumecs
h. Deepest head Level : 110.26 M.G.T.S.
i. F.R.L. : 131.75 m.G.T.S.
j. D.S.L. : 121.75m.G.T.S.
k. Top of the Dam : 135.0 m.G.T.S.
l. Spillway’s crest level : 131.75 m.G.T.S.
m. Maximum height of the Dam : 24.74m.
n. Spillway:
   i) Length : 55 m
   ii) Number of gates : 4
   Size : 11.5m x 10.25m

o. Total length of the non-overflow section : 2 x 62m = 124m

p. Total length of the earthen portion : 1681m

q. Number of head regulator : Nil

r. Length of link canal (lined) : Nil

3.3.3 BHAIRABBANKI RESERVOIR

a. Location:
   Village : Madankati
   P.S : Ranibandh
   Dist. : Bankura
   Latitude : 22° 47’N
   Longitude : 86° 50’E

b. Name of river : Bhairabbanki

c. Live storage : 1283.71 h.m..

d. Dead storage : 305.16 h.m..

e. Gross storage : 1588.87 h.m.

f. Reservoir submergence at F.R.L. : 360.94 ha.

g. Maximum flood discharge : 1634 cumecs

h. Deepest bed level : 119.80 m.G.T.S.

i. F.R.I. : 136.00 m.G.T.S.

j. D.S.L. : 127.50 m.G.T.S.

k. Top of the Dam : 139.29 m.G.T.S.
1. Spillway’s crest level : 127.50 m.G.T.S.

m. Maximum height of the dam : 19.42m.

n. Spillway:
   i) Length : 53m
   ii) Number of gates : 4

Size : 11m x 8.75 m

o. Total length of the non-overflow section : 2 x 54m = 108m.

p. Total length of the earthen portion : 783 m.

q. Number of head regulator : Nil.

r. Length of link canal (lined) : Nil

3.3.4 PARANG WEIR

a. Location:
   Village : Jalhari
   P.S. : Salboni
   Dist. : Medinipur
   Latitude : 22° 32'N
   Longitude : 87° 15' E

b. Name of the river : Parang


d. Maximum flood discharge : 1641 cumecs

e. Deepest bed level : 35.50 m.G.T.S.

f. F.R.L. : 40.12 m.G.T.S.

g. Crest level of the weir : 40.12 m.G.T.S.

h. Length of the weir : 176 m.

i. Crest level of under the sluice : 35.50 m.
j. Under sluice portion:
   i) Length : 12m.
   ii) Number of gates : 2 : 5m x 5m.

k. Head regulator:
   i) Length : 7.5m
   ii) Number of gates : 2
   Size : 3m x 1.5m.

l. Length of link canal (lined) : 11.50 k.m.

Source: Report of Modernisation of Kangsabati Reservoir Project, 1988, Irrigation Department, Govt. of West Bengal.

3.4.0 PHYSICAL AND SOCIAL BENEFITS OF THE PROJECT

I. Supply of irrigation water:
   a) On kharif season : 340730 ha. (842,000 acres)
   b) On rabi season : 60729 ha. (150,000 acres)

II. Reclamation of wasteland : 20235 ha. (50,000 acres)

III. Moderation of peak flood discharge : 6376-10627 cumecs.

IV. Supply of drinking water for cattle in the command area where scarcity of drinking water is felt acute.

V. Culture and production of fish in the lakes behind the dams and barrages.

VI. Creation of recreation facilities (scenic beauty of dams, barrages, reservoirs, hills-forest, parks etc.).

VII. Benefited districts:
   a) Bankura (13 Blocks)
   b) Medinipur (20 Blocks)
   c) Hugli (02 Blocks)

VIII. Flood control area : 80.938.89 hectares (2.00000 acres)

Source: Report of Modernisation of Kangsabati Reservoir Project, 1988, Irrigation Department, Govt. of West Bengal.
3.5.0 PHYSICAL AND SOCIAL PROBLEMS OF THE PROJECT

I. Submerged area of Kangsabati reservoir: 13660 ha. (33760 acres)
   a) Over Kangsabati river: 6733 ha. (16640 acres)
   b) Over Kumari river: 6927 ha. (17120 acres)

II. Number of affected mouzas (fully and partially): 84 (Table No. 3.2, Appendix -III)

III. Cultivable land affected: 7612 ha. (18813 acres)

IV. Other land affected: 6048 ha. (14947 acres)

V. Number of people affected: 15,000 (official source)
   25,000 (other source)

VI. Number of family affected: 5000 (official source)
   10,000 (other source)

VII. Number of houses and buildings affected: 3000 (official source)
   5000 (other source)

VIII. Cost of construction: 25.36 crores (proposed) [1955-56]
     285.31 crores (2001)
     345.00 crores (2007)

IX. Time of construction: 5 years (proposed); more than 51 years till now for the construction of canal networks.

X. Disruption of transport and communication systems due to reservoirs and construction of canals

XI. Complete failure of resettlement and rehabilitation of the oustees

XI. Minimum amount of compensation in monetary terms paid to the losers at the time of acquisition of land:

Acquired lands submerged for construction works:

a). Cultivated land

b). Uncultivated land

i) Culturable waste land

ii) Waste land

iii) Forest land

Rs.3,14,52800.00

Rs.1,54,21,700.00

c) Structures such as buildings, temples, wells and tanks etc.

d) Cost of standing crops

e) Cost of trees on highlands

Rs. 4,33,200.00

f) Cost of archeological monuments, if any

g) Cost of prospective mineral deposits, if any

h) Solium charges @ 15% of costs of land and property

Rs. 70,96,155.00

i) Land acquisition establishment charges

@ 6.25% of cost of land and property

Rs. 29,56,731.00

j) Rent for use of land

Rs. 50,000.00

k) Interest charges @ 6% on 50% of land and property for 2 years

Rs. 28,38,462.00

l) Legal charges @ 7.50% of cost of land and property

Rs. 35,48,077.00

m) Relocation .... 11km @ Rs. 107,000.00

per km.

Rs. 11,77,000.00

n) Cost of Rehabilitation for 8000 persons

@ Rs. 1000 each

Rs. 80,000.00

o) Cost of labourer and materials for demarcation and joint measurements of land and other properties

Rs. 50,00,000

7,34,74,125.00
3.5.1 RESERVOIR SUBMERGENCE AREA OF PICK UP BARRAGES

a) Silabati reservoir  :  1865.27 ha. (4609.08 acres)
b) Tarapheni reservoir  :  427.00 ha. (1055.11 acres)
c) Bhairabanki reservoir  :  360.94 ha. (891.88 acres)
d) Parang Weir  :  18.00 ha. (291.58 acres)

3.5.2 DISPLACEMENT OF POPULATION OF PICK UP BARRAGES

a) Silabati reservoir  :  5422 persons
b) Tarapheni reservoir  :  395 persons
c) Bhairabanki reservoir  :  905 persons
d) Parang Weir  :  Nil

3.6.0 COST OF CONSTRUCTION OF PICK UP BARRAGES

A) Earthen Dam:

i) Silabati:  
   Amount (Rs)  15,81,00,000.00

ii) Tarapheni:  
   Amount (Rs)  7,10,35,000.00

iii) Bhairabanki:  
   Amount (Rs)  3,82,35,000.00

   Total:  267370000.00

B) Concrete Dam:

i) Silabati Spillway:  
   Amount (Rs)  10,61,62,000.00

ii) Tarapheni Spillway:  
   Amount (Rs)  7,20,90,000.00

iii) Bhairabanki spillway:  
   Amount (Rs)  8,10,32,000.00

iv) Parang Weir:  
   Amount (Rs)  2,22,07,000.00

   Total:  281491000.00
<table>
<thead>
<tr>
<th>C) Outlets (Regulator)</th>
<th>Amount (Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Head Regulator of Silabati Reservoir</td>
<td>2, 77,000.00</td>
</tr>
<tr>
<td>ii) Head Regulator of Parang weir</td>
<td>12, 01,000.00</td>
</tr>
</tbody>
</table>

\[ \text{\underline{3998000.00}} \]

Source: Report of Modernisation of Kangsabati Reservoir Project, 1988, Irrigation Department, Govt. of West Bengal.
REFERENCES


