

CHAPTER - X

COST ESTIMATE

10.0 General

The Kosi-Mechi intrastate link project envisages construction of 117.5 km link canal including remodelling of existing Eastern Kosi Main Canal of 41.30 km, branch canals of extended new canal upto river Mechi, 112 numbers CD/CM structures, distribution system alongwith development of command areas of the project.

This chapter has been prepared as per the “Guidelines for Preparation of Detailed Project Report of Irrigation and Multipurpose Projects-2010” issued by MoWR, Government of India. The cost estimate for the project has been prepared based on the quantities worked out from the field survey and designs of the various structures. The rates have been taken from CSR, 2012 of Government of Bihar. Wherever, necessary, the rates have been escalated @8% per annum to arrive at the cost for the year 2013-14.

10.1 Classification of units

The cost of the project has been worked out under following units:

1. Unit-I: Head works – Existing Hanuman Nagar barrage will be utilized.
2. Unit-II: Canal and canalization – Main canal including remodelling of EKMC, branch canals of extended canal, CD/CM structures and distribution system.
3. Unit-VI : Command area development

The cost estimate of the project works out to Rs.290325.42 lakh.

Table 10.1
Cost estimate of the project

Unit: Rs. in crore

Component	Unit-I	Unit-II	Unit-VI	Total
	Head works	Canal and canalisation	Command area development	
Kosi-Mechi link canal	Nil	2684.18	219.07	2903.25

Thus, the total cost of the link project works out to be Rs.2903.25crore at 2013-14 price level which includes Environmental Management Plan (EMP). The details under various heads are described in the following paragraphs.

10.1.1 Unit–I: Headworks

The Kosi-Mech link canal is the extension of Existing Kosi Main Canal (EKMC) offtakes from the left bank head regulator of existing Hanuman Nagar barrage. The existing head regulator consists of 7 number of gates each having a discharge capacity of 85 cumec and is adequate to divert the combined discharge of existing and extended Kosi-Mechi link canal of 573 cumec. Hence, no provision has been made towards the cost of headworks under unit 1. However, 1% of apportioned cost of barrage of Rs.101.28 crore (escalated upto 2013-14) has been considered as annual maintenance cost of barrage. Thus, annual maintenance cost has been taken as Rs.1.01 crore.

10.1.2 Unit–II: Canal and canalization

The total cost of Unit-II canal system including command area development is estimated to be Rs. 2903.25 crore at 2013-14 price level. Details are given in Annexure 10.1 and their sub-annexures. The sub-head wise details are discussed in the following paragraphs.

10.1.2.1 A-Direct charges

I-Works

‘A’ Preliminary

Rs.4702.17 lakh

Provision under this sub-head has been made to cover the actual expenditure incurred on detailed survey and investigation works mentioned below for preparation of Detailed Project Report of this project.

- Topographical surveys and investigations
- Geological and geotechnical surveys
- Construction material survey
- Vehicle charges for inspecting officers for site investigations
- Survey and camp equipment
- Charges for consultation for various studies

- Actual expenditure on establishment and
- Preparation of Detailed Project Report

However, for detailed survey and investigations for establishing the final locations of different project components at pre-construction stage, a lump sum provision of 2% of I-Works has been made under this sub-head. The details are given in Annexure 10.1.1.

‘B’ Land Rs.27323.25 lakh

Under this sub-head, cost of acquisition of land required for canals and canal structures compensation for property and standing crops, solatium charges and diversion of communication system etc. have been taken in consideration. Under this sub-head, provision for acquisition of land for construction canals viz. Kosi-Mechi link canal, approach roads, colonies, canal structures etc., rent for use of land prior to acquisition etc. have been considered. The details are given in Annexure 10.1.2.

‘D’ Regulators Rs 11003.27 lakh

Under this sub-head, provision for head and cross regulators at appropriate locations on main canal, service gates with embedded parts, stop logs and rope drum hoists, monorail arrangements, etc. at regulators have been made. Provision for cross regulators for branch canals has also been made. Estimate of a typical cross regulator and head regulator is prepared based on the detailed drawings prepared departmentally and the costs of other regulators are arrived based on the estimated cost of the typical regulator proportionate to discharges. The details are given in **Annexure 10.1.3.**

‘F’ Cross drainage works Rs.25186.83 lakh

The cross drainage works proposed across the main canals and branch canals are aqueducts, syphon aqueducts, canal syphons, and culverts to facilitate the crossing of rivers/streams. Certain typical structures are estimated based on the design drawings. The cost of the structures is worked out as per the detail designs and drawings prepared departmentally. The details are given in Annexure 10.1.4.

‘G’ Bridges**Rs.4712.42 lakh**

A number of bridges (major and minor) are required to be constructed in the Kosi–Mechi link canal of the project to facilitate crossing of various roads. Necessary provision has been made towards construction of these bridges. The cost is worked out as per the drawings prepared departmentally. The details are given in Annexure 10.1.5.

‘H’ Escapes**Rs.841.07 lakh**

Under this sub-head provision has been made for canal escapes at suitable locations where drainage facilities exist to take care of the discharges in the eventuality of canal breaches. The details are given in Annexure 10.1.6.

‘K’ Buildings**Rs.3319.30 lakh**

Provision has been made under this sub-head for construction of temporary and permanent buildings for both residential and non-residential buildings for various categories of staff, offices, inspection bungalow, stores, club-cum-welfare hall, laboratory and Research station etc. Rates have been adopted for these buildings based on the plinth area and prevailing market rates. The details under this sub-head are given in Annexure 10.1.7.

‘L’ Earthwork and lining**Rs.108465.67 lakh**

The earthwork quantities involved in cutting based on the type of soil are separately worked out. The quantity of earthwork required for embankment from borrow areas are separately worked out. The detailed estimates are prepared considering the cross sections taken at 50 m interval along the canals and detailed drawings supplied by CWC, New Delhi at various sections. Provision is also made for branch canals proportionate to the discharges of the main canal. Lining is provided for both main and branch canals at bed and side slopes in the entire length of canals as per the drawings. Provision is also made in the estimates for pressure relief and drainage arrangements under lining, expansion joints etc. The details under this sub-head are given in Annexure 10.1.8.

'M' Plantation**Rs. 50.71 lakh**

Under this sub-head, cost of plantation in the colony areas and along the main canals and branch canals on both sides has been provided. The details are given in Annexure 10.1.9.

'O' Miscellaneous**Rs.1073.73 lakh**

Under this sub head provision has been made to cover the cost of the following works:

- Capital cost of electrification, water supply purification and distribution arrangements, sewage disposal, firefighting equipment, telephones, wireless sets, equipment for quality control and field labs, initial equipment and other accessories for hospitals etc.
- R and M of above equipments/infrastructural facilities etc.
- R and M of inspection vehicles, inspection bungalow etc.

Provision has also been made for other miscellaneous items such as inaugural foundation laying ceremony, compensation to work men, flood lighting, model exhibits etc. The details are given in Annexure 10.1.10.

'P' Maintenance**Rs.1990.51 lakh**

Under this sub head provision has been made to cover the cost of maintenance of all works during the construction of canals. A provision of 1% cost of I-works less A-Preliminary, B-Land and Q-Spl. TandP has been made. The details are given in Annexure 10.1.

'Q' Special tools and plants**Rs.4032.00 lakh**

Under this sub-head provision has been made at 25% of capital cost of major construction equipment and general purpose equipment. Cost of inspection/ transportation equipment has been added to the above cost in full to arrive the total cost chargeable under this sub-head. The recoveries on account of resale value of Q-Special TandP is considered as 75% of the capital cost of the major construction/general purpose equipment and cost of inspection/transport equipment chargeable to Q-Special TandP. which works out to Rs.3024 lakh. The

cost chargeable to the canal works are given in Annexure 10.1.11 and 10.1.

‘R’ Communication **Rs.6590.02 lakh**

Under this sub-head, provision for construction of temporary roads and remodelling of existing roads for approach to canal and regulatory system, quarry sites and other working areas has been kept. The details are given in Annexure 10.1.12.

‘U’ Distributaries and minors **Rs. 10311.00 lakh**

Under this sub-head provision has been made for providing distributaries and minors considering a cost of Rs. 3800/- per ha for the total culturable command area of K-M link canal. The details are given in Annexure 10.1.13.

‘V’ Water courses and field channels **Rs.4833.0 lakh**

Under this sub-head provision has been made for providing water courses and field channels considering a cost of Rs.4500/- per ha as worked out for a typical block of 40 ha for the total culturable command area under the project. The details are given in Annexure 10.1.14.

‘W’ Drainage **Rs.17672.0 lakh**

This sub-head includes provision for extensive management measures such as Drainage development, improvement of existing drainages, construction of new drainages Under this sub-head provision has been made at the rate of Rs.4500/- per ha for total command area for field drainage. The details are given in Annexure 10.1.15.

‘X’ Environment and ecology **Rs.2053.00 lakh**

This sub-head includes provision for extensive management measures to sustain environment and ecology such as land management plan (stabilization of muck disposal management), measures to arrest transportation of silt across basins, provision for free fuel to department engaged labourer, Public Health management and Environmental Management Plan (EMP). The details are given in Annexure 10.1.16.

‘Y’ Losses on stock and unforeseen Rs.587.77 lakh

Provision has been made for losses on stock and unforeseen @ 0.25% on all sub-heads under I-works excluding sub-heads A- preliminary, B-land and Q-Spl. TandP.

II-Establishment Rs.20742.45 lakh

Provision has been made as per norms @ 10% of I-Works excluding B- land towards establishment and pensionary charges.

III- Ordinary T and P Rs.2347.48 lakh

Provision has been made under this head for ordinary Tools and Plant @ 1% of I-Works. This provision is distinct from the Q-Spl. TandP and is meant to cover the cost of survey instruments, camp equipment and other small tools and plant.

IV – Receipt and recoveries Rs.3504.37 lakh

Under these head, estimated recoveries by way of resale or transfer of temporary buildings, special T and P and by resale or transfer of generator sets, electrical lines, telephone lines and other accessories are accounted for and provision has been made accordingly.

10.1.2.2 B - Indirect charges Rs.14084.86 lakh

Provisions for abatement of land revenue and Audit and account charges are covered under ‘Indirect charges’ at the following rates

(i) Audit and account charges

A total provision of Rs. 2347.48 lakh @ 1% cost of the I-Works has been kept for the audit and accounts charges.

(ii) Abatement of land revenue

A total provision @ 5% cost of B-land (culturable area) amounting to Rs.11737.86 lakh for abatement of land revenue have been made under this sub-head.

The total estimated cost under Unit-II-Canal and canalization including remodelling of EKMC have been worked out to be Rs.268418.14 lakh. General abstract of cost of Unit-II is given in Table-10.2 and estimated cost of canal and canalization including remodeling of EKMC and command area development is given in given in Annexure-10.1.

10.1.3 Unit–VI: Command area development Rs.21907.29 lakh

The total culturable command area covered under this project is 214812 ha. The entire command area is flat having a slope ranging from 1:4000 to 1:6500, hence no significant land leveling is required. However, provision has been made at Rs. 22663/- per ha for development of command area which works out to Rs. 21907.29 lakh. The details are given in Annexure 10.1.17.1. However, in the cost estimate this expenditure is included in Unit-II: Canal and Canalisation,

Table 10.2**Unit – II Canal and canalization – General abstract of cost**

Sl. No.	Item(s)	Amount Rs. in lakh
	Direct charge	
I.	Works	
	‘A’ – Preliminary	4702.17
	‘B’ – Land	27323.25
	‘D’ – Regulator	11003.27
	‘F’ – Cross Drainage Works	25186.83
	‘G’ – Bridges	4712.42
	‘H’ – Escape	841.07
	‘K’ – Buildings	3319.30
	‘L’ – Earthwork including canal lining	108465.67
	‘M’ – Plantation	50.71
	‘O’ – Miscellaneous	1073.73
	‘P’ – Maintenance	1990.51
	‘Q’ – Special T and P	4032.00
	‘R’ – Communications	6590.02
	‘U’ – Distributaries, minors and sub-minors	10311.00
	‘V’ – Water courses	4833.00
	‘W,X’ – Environment and ecology including drainage (1% of I-work)	19725.00
	‘Y’ – Losses on stock and unforeseen item	587.77
	Total I – Work	234747.72
II.	Establishment	20742.45
III.	Ordinary Tools and Plants	2347.48
IV.	Deduct receipt and recoveries	(-)3504.37
	Total direct charges	254333.51
V.	Indirect charges	14084.86
	Grand total	268418.14

10.2 Total cost of the project

The total estimated cost of Kosi-Mechi link project works out to Rs. 2903.25 crore at the price level of the year 2013-14 including the cost of Unit-I Headworks, Unit-II Canal and canalization including remodelling of EKMC and Unit-VI Command area development.