

Chapter 13

Estimates

13.1 General

The estimates for the project are prepared based on the Working Group Report "Guidelines for preparation of detailed project reports of irrigation and multipurpose projects" of Govt. of India, Ministry of Irrigation, 1980.

The total cost of the Godavari (Inchampalli) - Krishna (Pulichintala) link project is estimated under five units. The cost of 'head works' is given in **Unit-I**. The cost of 'conveyance system' is given under Unit-II. The cost of 'power component' is given under Unit-III. The cost of lifting arrangements is given under Unit-IV. The cost of 'On farm development' is given under Unit - V. The total cost of the link project is estimated to be Rs. 504608 lakh for all five units. The cost estimates have been prepared on the basis of the latest available 2003-04 schedule of rates.

13.1.1 Classification of minor heads /sub-heads

The estimated cost of the works under the link project has been divided into the following minor heads classified as direct and indirect charges.

A. Direct charges

Direct charges include the following items: (Rs. in lakh)

I Works	448604
II Establishment	47411
III Tools & Plants (Ordinary)	4183
IV Suspense	Nil
V Receipts & Recoveries	(-) 3364
Sub-total	496834

B. Indirect charges

Indirect charges include the following: (Rs. in lakh)

a) Capitalised value of abatement of land revenue	853
b) Audit and account charges	4364
Sub-total	5217
c) On farm Development charges	2557
Total cost	504608

say Rs. 5046 crore

13.2 Unit I – Head works

The Inchampalli reservoir diverts water for both the Inchampalli – Nagarjunasagar and Inchampalli – Pulichintala link project besides benefiting its own command. As such the cost of the project has been apportioned as per the quantum of water utilisation. The Government of Andhra Pradesh has already prepared the detailed project report for Inchampalli project using schedule of rates of 1987-88. The above rates in Detailed Project Report is proposed to be escalated at the rate of 10% per annum to the year 2003-04 for working out the cost of Head Work.

The apportioned cost of head works chargeable to Godavari (Inchampalli) – Krishna (Pulichintala) is estimated to be Rs. 30640 lakh.

13.2.1 Classification of minor heads/sub-heads

The estimated cost of **Unit-I** has been divided into the following minor heads classified as direct and indirect charges.

A. Direct charges

Direct charges include the following items (Rs. in lakh)

I Works	28999
II Establishment	1674
III Tool & Plants (Ordinary)	167
IV Suspense	Nil
V Receipts & Recoveries	(-) 7424
Sub-total	30416

B. Indirect charges

Indirect charges include the following: (Rs. in lakh)

a) Capitalised value of abatement of land revenue	57
b) Audit and account charges	167
Sub-total	224
Total cost of head works	30640

Say Rs.306 crore

13.2.2 A. Direct charges

I -Works

'A' Preliminaries: The provision made under this sub-head is Rs. 519 lakh. This sub-head covers the expenditure on investigations to be conducted during execution, surveys, designs, field tests etc.

'B' Land: The land acquisition required for head works and reservoir, based on the Detailed Project Report, is considered for arriving cost under this sub head. This cost is apportioned to the link canal based on the quantity of diversion. This works out to Rs. 9591 lakh.

'C' Works: Provision of Rs. 12991 lakh is made for construction of the Inchampalli dam including the dyke and head regulator.

The cost of headworks and head regulator is worked out based on the cost estimates of Inchampalli Joint Project, prepared by Govt. of Andhra Pradesh considering 10% rate of escalation per annum.

'K' Buildings: These are classified broadly as permanent and temporary buildings. These are further classified as residential and non-residential buildings. A sum of Rs. 2297 lakh is provided for buildings.

'M' Plantations: An amount of Rs. 57 lakh is provided under this sub head.

'O' Miscellaneous: An amount of Rs. 1677 lakh is provided under this sub-head.

'P' Maintenance: An amount of Rs.47 lakh is provided under this sub-head as lump sum for maintenance of all head works during construction period.

'Q' Special tools & Plants: An amount of Rs. 286 lakh is provided under this sub-head to cover cost of special Tools and Plants like excavators, concrete mixers, water pumps, etc.

'R' Communications: A provision of Rs.1451 lakh is made under this sub-head towards laying of 10 km of temporary roads for connecting important work spots with existing roads.

'X' Environment & ecology: An amount of Rs. 47 lakh is kept under this sub head.

'Y' Losses on stock and unforeseen: A provision of Rs. 36 lakh is made under this sub-head.

II - Establishment

An amount of Rs.1674 lakh is provided under this sub-head for establishment including leave and pension charges at 10% on I-Works.

III – Tools & Plants (Ordinary)

A sum of Rs.167 lakh at 1% of the cost of I-Works is provided under this sub-head to cover the cost of survey instruments, camp equipment, office furniture and equipment and other small tools.

IV – Suspense

No provision is kept under this head.

V – Receipts & Recoveries

An estimated deduction by sale of special T&P at 75% recovery of the provision under Q-Special Tools and Plants is provided as Rs. 424 lakh.

13.2.3.1 B. Indirect Charges Audit and Account charges

A provision of Rs. 167 lakh is made under this head at about 1% of the cost of I-Works to cover the audit and account charges.

13.2.4 Abatement of land revenue

A provision of Rs. 67 lakh is made under this head on land cost.

13.3 Unit II – Conveyance system

Total cost of conveyance system consisting of link canal, branch canals, distributaries, field channels etc. including the structures works out to Rs. 425179 lakh.

13.3.1 Classification of minor heads / sub-heads

Unit-II has been divided into the following minor heads classified as direct and indirect charges.

A. Direct charges

Direct charges include the following items: (Rs. in lakh)

I	Works	376490
II	Establishment	43269
III	Tools & Plants (Ordinary)	3765
IV	Suspense	Nil
V	Receipts & Recoveries	(-) 2906
	Sub-total	420618

B.	Indirect charges:	
	Indirect charges include the following items:	Rs. in lakhs
	a) Capitalised value of abatement of land revenue	796
	b) Audit and account charges	376
	Sub-total	4561
	Total cost of conveyance system	425179

Say Rs.4252 crore

13.3.2 A. Direct charges

I –Works

'A' Preliminaries: The provision made under this sub-head is Rs. 7529 lakh. The cost is worked out at 2% on cost of I-Works. This sub-head covers the expenditure on investigations to be conducted during execution, surveys, design studies, field tests etc.

'B' Land: Provision made under this sub-head covers the cost of land acquisition for link canal, branch canals, distributaries, field channels, power house, pump house and camp colonies (i.e land to be acquired under **Units- II, III and IV**). The cost of land acquisition and related items works out to Rs. 15913 lakh.

'D' Regulators: A provision of Rs.1886 lakh has been made for construction of cross regulators and offtake sluices for link and canal distribution system.

'F' Cross drainage works: The cross drainage works are (1) aqueducts (2) siphon aqueducts (3) under tunnels and (4) super passages. Cost of these structures is deduced from the cost curves. Total cost of cross drainage works is estimated to be Rs.22257 lakh.

Aqueducts: The total cost of aqueducts comes to Rs. 9217 lakh.

Syphon aqueducts: The total cost of syphon aqueducts comes to Rs. 3000 lakh.

Under tunnels: The total cost of under tunnels comes to Rs. 7316 lakh.

Superpassages: The total cost of superpassages comes to Rs. 2724 lakh.

'G' Bridges: The total cost of bridges works out to Rs.1792 lakh.

Single lane bridges: The cost under this sub-head works out to Rs.1332 lakh.

Double lane bridges: The cost of double lane road bridges works out to Rs. 319 lakh.

Railway bridges: The cost of railway bridges works out to Rs. 141 lakh.

'H' Escapes: The total cost of escapes comes to Rs. 229 lakh.

'K' Buildings: The buildings are classified broadly as permanent and temporary buildings. These are further classified as residential and non-residential buildings. A sum of Rs.5696 lakh is provided for buildings.

'L' Earthwork and lining: Total cost of earthwork and lining for the link canal is estimated to be Rs. 280249 lakh. The cost of earthwork for link canal is computed based on the expected geological data as obtained from the geophysical surveys conducted by National Geophysical Research Institute, Hyderabad for the reach from Kinnerasani river crossing (RD 149.60 km) to Pulichintala (RD 312.2 km). The same is extrapolated to the initial unsurveyed reach keeping in view the geophysical similarities.

'M' Plantation: The plantation required under **Units II, III and IV** has been considered under this sub-head. The cost of the plantation works out to Rs. 752 lakh.

'N' Tanks and reservoirs: A sum of Rs.40 lakh is provided for improving the existing tanks in the command area.

'O' Miscellaneous: The total provision made under this sub-head is Rs.1002 lakh.

'P' Maintenance: A provision of Rs.13142 lakh is made under this sub-head for the maintenance of all works during construction period.

'Q' Special Tools & Plants: A provision of Rs. 1492 lakh is made under this sub-head. The net amount charged to special tools and plants is computed after deducting hire charges at 75% on the capital cost of machinery.

'R' Communications: A lump sum provision of Rs.356 lakh is made under this sub-head for connecting important work spots with existing roads, roads to quarries, temporary diversion etc.

'U' Distributaries, minors and sub-minors: A provision of Rs.13596 lakh is made under this sub-head.

'V' Water courses/Field channels: A provision of Rs.4056 lakh is made under this sub-head for providing field channels in the command area.

'W' Drainage: A provision of Rs.4659 lakh is made under this sub-head for drainage system in command area.

'X' Environment and Ecology: A provision of Rs. 966 lakh is made under this sub-head. This sub-head covers the cost for afforestation (3864 ha) proposed for affected forest area. The afforestation is proposed to be taken up in degraded forest amounting to twice the land affected. A lump sum provision of Rs. 25,000 per ha is provided.

'Y' Losses on stock and unforeseen: A provision of Rs. 878 lakh at 0.25% of I-Works less 'A' Preliminaries, 'B' Land and 'Q' Special Tools & Plants is made under this sub-head in the estimate.

II- Establishment

An amount of Rs. 43269 lakh is provided under this sub-head for establishment including leave and pension charges at 12% on I-Works less B-Land.

III – Tools & Plants (Ordinary)

A sum of Rs. 3765 lakh at 1% of the cost of I-Works is provided under this sub-head to cover the cost of survey instruments, camp equipment, office furniture and equipment and other small tools.

IV – Suspense

No provision is kept under this head.

V – Receipts & Recoveries

An estimated deduction by sale of special T&P at 75% recovery of the provision under 'Q'- Special Tools and Plants along with resale value of temporary buildings and receipts from rents on buildings is provided as Rs. 2906 lakh.

13.3.3 B. Indirect Charges

a) Audit and Account charges

A provision of Rs. 3765 lakh is made under this head at about 1% of the cost of I-Works to cover the establishment charges of the Accounts staff.

b) Abatement of land revenue

A provision of Rs.796 lakh at 5% of the land cost is provided towards abatement of land revenue due to land acquisition for canals and camps.

13.3.4 Estimated cost of conveyance system

The total estimated cost of conveyance system of Godavari (Inchampalli) – Krishna (Pulichintala) link project works out to Rs. 425179 lakh.

13.4 Unit III- Power component

Power component under the link canal project comprises of (i) main powerhouse at head works and (ii) 3 nos. of canal powerhouses utilising the 27 m fall on link canal. The dam toe power house is mainly for pumped storage purpose and it will be operated during peak hour energy needs. This necessitated a construction of tail pond downstream. Since, the entire cost of power component at dam and tail pond including benefits is charged in Inchampalli – Nagarjunasagar link project, the same is not accounted in this link project.

The canal power house comprises the fore bay, by pass arrangement, power houses, penstock, tail race etc which are considered for estimation. The total cost of 3 canal powerhouses works out to Rs. 5336 lakh and is considered under Unit – III.

13.4.1 Classification of minor heads/ sub-heads

Unit-III has been divided into the following minor heads classified as direct and indirect charges.

A. Direct charges

Direct charges include the following items:		(Rs. in lakh)
I	Works	4992
II	Establishment	271
III	Tools & Plants (Ordinary)	31
IV	Suspense	Nil
V	Receipts & Recoveries	(-) 8
	Sub-total	5286
B.	Indirect charges:	
	Indirect charges include the following items:	
	a) Audit and account charges	50
	Sub-total	50
	Total cost of power component of the link project	5336

Say Rs. 53 crore

13.4.2. A. Direct charges I-Works

'A' Preliminaries: The provision made under this sub-head is Rs. 100 lakh. The percentage worked out is 2% on cost of I-Works. This sub-head covers the expenditure on investigations to be conducted during execution, surveys, design studies, field tests etc.

'J' Power plant civil works: Cost of civil works for the power plants works out to Rs. 1370 lakh.

'K' Buildings: Buildings are classified broadly as permanent and temporary buildings. These are further classified as residential and non-residential buildings. A sum of Rs.13 lakh is provided for buildings.

‘O’ Miscellaneous: A lump sum provision of Rs. 64 lakh is made under this sub-head for the miscellaneous works i.e. telephone system, water supply, drainage, medical and, etc. during construction period.

‘P’ Maintenance: A provision of Rs. 63 lakh is made under this sub-head for the maintenance of all works during construction period.

‘Q’ Special Tools & Plants: A lump sum provision of Rs. 14 lakh is made under this sub-head.

‘R’ Communications: No provision is made under this sub-head, since the communication net work of main canal is planned to be used.

‘S’ Power plant electrical works: The cost of power plant electrical works is estimated to be Rs. 3356 lakh.

‘Y’ Losses on stock and unforeseen: A provision of Rs. 12 lakh at 0.25% of I-Works less ‘A’ Preliminaries and ‘Q’ Special Tools & Plants is made under this sub-head in the estimate.

II-Establishment

An amount of Rs. 271 lakh is provided under this sub-head considering 10% of the cost of civil works and 4% of the cost of electrical works under I-Works.

III – Tools & Plants (Ordinary)

A sum of Rs. 31 lakh is provided under this sub-head to cover the cost of survey instruments, camp equipment, office furniture and equipment and other small tools which works out to about 1% of the cost of civil works and 0.5% of the cost of electrical works under I - Works.

IV – Suspense

No provision is kept under this head.

V – Receipts & Recoveries

An estimated deduction by sale of special T&P considering 75% recovery of the provision under Q-Special Tools and Plants along with resale value of temporary buildings and receipts from rents on buildings is provided as Rs. 8 lakh.

13.4.3 B. Indirect Charges

Audit and Account charges

A provision of Rs. 50 lakh is made under this head at about 1% of the cost of I-Works to cover the establishment charges of the Accounts staff.

13.4.4 Estimated cost of power component

The total estimated cost of the power component of Godavari (Inchampalli) – Krishna (Pulichintala) link canal project i.e under **Unit – III** works out to Rs.5336 lakh.

13.5 Unit IV- Lifting arrangements

Lifting arrangements are provided on 1) Link canal at 200 km to feed the existing NSLBC and 2) Pulichintala reservoir to NSRBC command. The cost estimates are prepared for both of the components separately. The total cost of lifting arrangements is arrived at 40896 lakh, which is considered under **Unit – IV**.

13.5.1 Classification of minor heads/ sub-heads

Unit-IV has been divided into the following minor heads classified as direct and indirect charges.

A. Direct charges

Direct charges include the following item:

(Rs. in lakh)

I Works	38123
II Establishment	2197
III Tools & Plants (Ordinary)	220
IV Suspense	Nil
V Receipts & Recoveries	(-) 26
Sub-total	40514
B. Indirect charges:	
Indirect charges include the following	
a) Audit and account charges	382
Sub-total	382
Total cost of power component of the link project	40896 Say Rs. 409 crore

13.5.2. A. Direct charges

I-Works

'A' Preliminaries: The provision made under this sub-head is Rs. 763 lakh. The percentage worked out is 2% on cost of I-Works. This sub-head covers the expenditure on investigations to be conducted during execution, surveys, design studies, field tests etc.

'J & S' Power plant civil & electrical works: Cost of civil & electrical works for the power plant works out to Rs.36623 lakh.

'K' Buildings: Buildings are classified broadly as permanent and temporary buildings. These are further classified as residential and non-residential buildings. A sum of Rs.37 lakh is provided for buildings.

'O' Miscellaneous: A provision of Rs. 174 lakh is made under this sub-head for the miscellaneous items of work during construction period.

'P' Maintenance: A lump sum provision of Rs. 373 lakh is made under this sub-head for the maintenance work during construction period.

'Q' Special Tools & Plants: A provision of Rs.60 lakh is made under this sub-head.

'Y' Losses on stock and unforeseen: A provision of Rs. 93 lakh at 0.25% of I-Works less 'A' Preliminaries and 'Q' Special Tools & Plants is made under this sub-head in the estimate.

II - Establishment

An amount of Rs. 2197 lakh is provided under this sub-head for establishment including leave and pension charges at 6 % on civil & electrical works under I-Works.

III –Tools & Plants (Ordinary)

A sum of Rs. 220 lakh is provided under this sub-head to cover the cost of survey instruments, camp equipment, office furniture and equipment and other small tools which works out to about 1% of the cost of civil works and 0.5% of the cost of electrical works under I-Works.

IV – Suspense

No provision is kept under this head.

V – Receipts & Recoveries

An estimated deduction by sale of special T&P at 75% recovery of the provision under Q-Special Tools and Plants along with resale value of temporary buildings and receipts from rents on buildings is provided as Rs.26 lakh.

13.5.3 B. Indirect Charges

Audit and Account charges

A provision of Rs. 382 lakh is made under this head at about 1% of the cost of I-Works to cover the establishment charges of the Accounts staff.

13.5.4 Estimated cost of lifting arrangements

The total estimated cost of the lifting arrangements of Godavari (Inchampalli) – Krishna (Pulichintala) link canal project i.e under Unit–IV works out to Rs. 40896 lakh.

13.6 Unit V – On farm Development

This head covers the cost involved for on farm development such as land levelling, modernization of drainage, communication etc. in the command area. A lump sum provision of Rs. 3000/- per ha is provided for this head.

The cost worked out under Unit - V is Rs 2557 lakh.