

Chapter – 11

Estimates

11.1 General

Estimate for the project is prepared as per the working group report Guidelines for preparation of detailed project report of irrigation and multipurpose projects” published by the erstwhile Ministry of Irrigation (now Ministry of Water resources), Government of India in the year 1980. Provisions are made under different units, minor heads and sub-heads.

11.2 Classification of heads

The project works will be grouped into the following units:

11.2.1 Unit-I: Head works and their appurtenant works

The provisions are made under various sub- heads as enunciated in the paras 11.3 and 11.4.

11.2.2 Unit-II: Main canal, branch canal, tunnels, lifts and canal structures

The cost under this head is worked out keeping in view of the guidelines of “Working Group Report”.

11.2.3 Unit-III: Hydropower installation

There is no hydropower station in the link project. Hence no provision has been made.

11.2.4 Unit –IV: Navigation works

Navigation is not proposed in the canals under Parbati- Kalisindh-Chambal link project. Hence no provision is made.

11.2.5 Unit – V: Water supply works

The water supply has been proposed through the link canal. But no separate provision is made under this head, as the cost of link canal worked out under the Unit-II: Head.

11.2.6 Unit - VI: Command area development works

A rate of Rs. 6244/- per ha of CCA is adopted for command area development which includes the cost of land acquisition also on the basis of Kushalpura medium multipurpose project district Rajgarh, M.P.

11.3 Classification of minor heads/sub-heads

The unit has been divided into the following minor heads classified as direct and indirect charges

Unit: Rs in lakh

Direct charges	
I - Works	54449.36
II - Establishment	3705.50
III- Tools and plants(Ordinary)	544.49
IV- Suspense	Nil
V- Receipts and recoveries	(-) 890.65
Sub total	57808.70
Indirect charges	
(a) Capitalised value of abatement of land revenue	869.72
b) Audit and account charges	544.49
Sub total	1414.21
Cost of seven reservoirs in upper Chambal sub basin	53133.49
Total cost of Unit - I	112356.40

11.4 Provision under the minor head I – works

All the works have been further sub divided into various sub-heads as listed below:

- A. Preliminary
- B. Land
- C. Works
- D. Regulators
- F. Cross drainage works
- G. Bridge
- H. Escape
- J. Power plant civil works
- K. Buildings
- L. i) Earth work (main canal)
ii) Lining
- M. Plantation
- O. Miscellaneous
- P. Maintenance
- Q. Special T&P
- R. Communication
- U. Distributaries, minors and sub-minors
- V. Water courses/field channels
- W. Drainage
- X. Environment and ecology
- Y. Losses on stock and unforeseen

While preparing works estimates for link projects, the Unified schedule of Rates, September, 2003, Water Resources Deptt. M.P. and typical estimates of Indira

Sagar project, M.P. have been adopted. The estimates of the projects under various alternatives are given in Table-11.1

Table - 11.1
Unit wise cost of project (Rs. in lakh)

	Patanpur to RPS dam Alt-(a)	Patanpur to GS dam Alt-(b)-I	Patanpur to GS dam Alt-(b)-I
Unit-I	112356.405	112356.405	112356.405
Unit-II	186545.540	200190.360	193473.29
Unit-III	-	-	-
Unit-IV	-	-	-
Unit-V	-	-	-
Total	298901.945	312546.765	305829.695

11.5 Requirement under different Sub heads

The provisions made under various sub-heads of the classified abstracts are as follows.

11.5.1 Unit-I Head works and their appurtenant works

The estimate under head works includes the cost of three dams in the enroute of main canal and seven dams in the upper reaches of Chambal basin. The total cost of unit-I Head works out to Rs 112356.40 lakhs, which includes direct and indirect charges. Details of estimates under different sub –heads are furnished below:

11.5.1.1 Direct charges

I - Works

A - Preliminary: This sub-head covers the expenditure on investigations so far incurred and likely to be incurred further, just before and during the period of execution such as general and annual surveys, design studies, including laboratory tests, publication of reports, fee of consultants, Camp equipment required for investigation staff, construction of access roads to facilitate investigation and also further investigation of foundations of spillways, earth dams etc. The expenditure for Geotechnical investigations, foundation exploration, construction materials survey, soil testing and environmental and ecological studies of the project has been included under this head. However, a provision of Rs. 1089 lakhs has been made for the preliminary sub-head at 2% of the cost of I- works.

B – land: The estimate provided is for acquisition of land upto FRL condition only. The total area coming under submergence of three reservoirs is 17308 ha. including river portion at FRL condition. The cost of cultivated lands has been worked out based on the local prevailing rates i.e. at the rates of Rs.50000/- per ha for head works. Provision for compensation for standing crops has also been made. The estimate cost of rehabilitation, resettlement including cost of lands under head: B-land of I-works works out to Rs. 17394.365 lakh.

C – Works: The estimate under this sub-head covers the cost of Patanpur, Mohanpura, Kundaliya dams and seven reservoirs in the upper reaches of Chambal basin. This includes preparation of foundation and excavation, bank protection works and core filling, grouting, drilling, drainage, masonry dams and appurtenants works, reinforcement and steel gates and other miscellaneous works. The overall provision under this sub heads works out to Rs. 29454.997 lakh.

K - Buildings: A lump sum provision of Rs. 1633.48 lakh (i.e 3% of cost of I-works) has been made under this sub-head. The amount provided under this sub head is for all the permanent and temporary categories of buildings (for residential and Non-residential buildings).

M - Plantation: A lump sum provision of Rs. 136.123 lakh (i.e. 0.25% of cost of I-works) has been made towards plantation of avenue trees, horticulture etc. required for beautification around the dam sites and at other important structures. The provision includes maintenance and protection for 2-3 years.

O – Miscellaneous: A provision of Rs. 2178/- lakh has been made to cover the capital cost of electrification, water supply, sewage disposal, telephone, medical equipments, recreation facilities etc. and their maintenance including running and maintenance of inspection vehicles. The provision made is 4% of the cost of unit I-works.

P – Maintenance: A provision of Rs. 719.32 lakhs has been made to cover the cost of maintenance of buildings, roads and other structures during the period of construction. The provision made is 2% of the cost of I- works excluding A-Preliminary, B- Land and Q-Special T&P and covers maintenance of all works during the construction period.

Q - Special T&P: A provision of Rs. 860.835 lakh has been provided for purchasing drilling machines, earth moving machinery and other ancillary machinery and equipments. 75% of the cost is recovered from works as hourly use rates. The net amount charged to 'Q' Special T&P is 25% of the capital cost of machinery and the entire capital cost of inspection and transport vehicles. The provision made for purchase of inspection and transport vehicles is Rs. 551.21 lakh. Thus a provision of Rs. 309.59 lakh is made under this head. 20% of the capital cost of inspection and transportation and transport vehicles has also been considered as resale value which workout to Rs 110.24 lakh.

R – Communications: A provision of Rs. 526.58 lakh is made under this sub-head for connecting work spots with existing roads.

X- Environment and Ecology: A provision of Rs. 544.494 lakh is made under this sub-head.

Y - Losses on stock and unforeseen: A provision of Rs. 87.80 lakh is made at 0.25% of cost of I-works less cost of A-preliminary, B-land and Q-Special T&P towards losses on stock of material due to natural causes.

Thus the total cost of I-works after considering all the above items works out to Rs. 54449.36 lakh.

II Establishment

An amount of Rs. 3705.50 lakh at 10% of the cost of I-works less B-land is provided under this sub head for establishment including leave and pensionary charges.

III Tools & plants (ordinary)

A provision of Rs. 544.50 lakh has been made under this sub head to cover survey instruments, camp equipment, office equipment and other small tools. The provision made is 1% of I-works.

IV Suspenses

The provision under this head is taken as Nil.

V Receipts and recoveries

75% of 25% cost of special T&P is taken as receipts and recoveries. For inspection vehicles 100% of capital cost provided under the special T&P and 20% of this provision shown under V-receipts and recoveries. The estimated recoveries by way of resale or renting of temporary buildings, resale of special tools and plants and miscellaneous receipts would be of the order of Rs. 890.65 lakh.

11.5.1.2 Indirect charges

Abatement and land revenue: A provision of Rs. 869.72 lakh at 5% of the cost of B-land has been made towards abatement and land revenue acquired for camp colony, borrow area and submergence areas.

Audit and account charges: A provision of Rs. 544.50 lakh at 1% of the cost of I - works has been made under this sub-head.

Thus, the total cost of indirect charges works out to Rs. 1414.21 lakh.

11.5.2 Unit – II Canals and Canalisation

The estimate of P-K-C link project covers cost of main canal, branches, distributaries, canal lining tunnels, lift and cross drainage structures etc. The unified schedule of rates September 2003 Water Resources Deptt., Madhya Pradesh and typical estimate of Indira Sagar project has been adopted to work out the cost estimate. The unit is sub-divided into different heads/sub-heads and the provision made under each head/sub-head is described below:

11.5.2.1 Direct Charges

I - Works

A-Preliminaries: The provision made under this sub-head is Rs. 3039.30 lakh, Rs. 3543.60 lakh and Rs. 3372.60 lakh for alternative (a), alternative (b)-I and alternative (b)-II respectively. 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.

B- Land: The provision made under this sub-head is Rs. 1660.01 lakh, Rs. 1646.66 lakh and Rs. 1218.57 lakh for alternative (a), alternative (b)-I and alternative (b)-II respectively. This sub-head covers the cost of land acquisition along the canal alignment, structures, and camp colonies. Provision is also made under this sub-head for (1) compensation for standing crops @ 35% of cultivable land, (2) compensation for wells, trees, houses, huts etc.,(3) solarium charges @ 15%, (4) establishment charges @ 6.25%.

Provision is also made @ 1% for measurement and demarcation of land and property, legal charges etc.

D- Regulators: The provision of Rs. 3657.74 lakh, Rs. 3389.82 lakh and Rs. 3845.57 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively. This head covers the cost of head regulators at the head of link canals, branch canals and cross regulators across the link canal.

F-Cross drainage works: The cross drainage works are (1) aqueducts (2) tunnels (3) Hume pipe culvert (4) Super passage (5) Drainage syphons (6) Canal syphons and (7) Barrage. The provision of Rs. 47093.59 lakh, Rs. 33149.00 lakh and Rs. 37439.05 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively.

G- Bridges: This sub-head covers the cost of National Highway road bridges, district road bridges, village road bridges and railway bridges including formation of approach embankments and diversion roads wherever necessary. The provision of Rs. 1280.87 lakh, Rs. 1336.07 lakh and Rs. 1154.39 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively.

H- Escapes: The provision of Rs. 55.64 lakh, Rs. 60.04 lakh and Rs. 59.06 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively.

J- Power Plant Civil Works: This sub-head covers the cost of pipes, pump house, pumping equipments, rising main and construction of intake well. The provision of Rs. 22052.43 lakh and Rs. 17790.15 lakh has been made under this sub-head for alternative (b)-I and alternative (b)-II respectively.

K- Buildings: Buildings are classified broadly as permanent and temporary buildings. These are further classified as residential and non-residential buildings. A provision of Rs. 4558.90 lakh, Rs. 5315.4 lakh and Rs. 5058.9 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively. The provision is made at 3% of cost of I-Works.

L- Earth work: (i) **Earth work:** The detailed cost of earth work for each alternatives of the link canal is estimated based on the hydraulic parameters. A provision of Rs. 74459.07 lakh, Rs. 78823.65 lakh and Rs. 74297.07 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively.

(ii) **Lining:** A provision of Rs. 13918.16 lakh, Rs. 12923.19 lakh and Rs. 11860.71 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively.

M- Plantation: A detailed estimate has been prepared for plantation in the entire length of link canal. The provision includes the cost of maintenance and protection for 3 years. A provision of Rs. 503.75 lakh, Rs. 483.48 lakh and Rs. 416.32 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively.

O- Miscellaneous: An amount of Rs 513.0 lakh is provided under this sub-head.

P- Maintenance: This sub-head covers the cost for maintenance of link canal, canal structures, colony buildings and colony roads during the construction. A provision of Rs. 969.40 lakh, Rs. 1010.60 lakh and Rs.952.20 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively.

Q- Special Tools and Plants: A provision of Rs. 171.68 lakh is made under this 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 provision of Rs. 189.0 lakh is made under this sub-head for connecting the important work spots with existing roads, roads to quarries, temporary river crossings etc.

U- Distributaries, Minors and Sub-Minors: A provision of Rs. 4526.46 lakh, Rs. 4947.75 lakh and Rs. 4880.87 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively. A rate of Rs. 6244/- per ha of CCA has been taken for the distributaries system inclusive of land acquisition, earth work excavated cross masonry, cross drainage structures on the basis of Kushalpur medium multipurpose project, district Rajgarh, Madhya Pradesh.

V- Water Courses/Field Channels: This sub-head covers the cost for providing field channels in the command area at the rate of Rs. 332/ per ha of CCA on the basis of Kushalpur medium multipurpose project, district Rajgarh, Madhya Pradesh.

W-Water Drainage: This sub-head covers the cost for providing drainage system in the command area. The estimate is prepared on the basis of Kushalpur medium multipurpose project, district Rajgarh, Madhya Pradesh. A provision of Rs. 343.62 lakh, Rs. 375.60 lakh and Rs. 370.52 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively.

Y- Losses on stock and unforeseen: A provision of Rs. 367.70 lakh, Rs. 429.50 lakh and Rs. 409.70 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively. The above cost is worked out at 0.25% of I-works less 'A' Preliminaries, 'B' Land and 'Q' Special T&P.

11.5.2.2 II - Establishment

A provision of Rs. 15030.46 lakh, Rs. 16259.09 lakh and Rs. 15697.02 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively. This sub-head covers the cost for establishment including leave and pension charges at 10% on I-works less B-Land. The total construction programme of link canal will be spread over a period of 8 years.

11.5.2.3 III - Tools and plants (Ordinary)

This sub-head covers the cost of survey instruments, camp equipments, office furniture & equipments and other small tools. A provision of 1% of the cost of I-works has been worked out to Rs. 1519.65 lakh, Rs. 1642.38 lakh and Rs. 1581.89 lakh under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively.

11.5.2.4 IV - Receipts and Recoveries

A provision of Rs. 813.84 lakh, Rs. 915.32 lakh and Rs. 879.15 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively. The estimated deduction by way of resale of transfer of temporary building and sale of special T&P and miscellaneous receipt from rent charges of buildings. A lump sum provision of 15% of the cost under K-building and 75% of the cost of Q-special T&P has been made in the estimate.

11.5.3 Indirect charges

Audit and Accounts Charges: A provision of Rs. 1519.65 lakh, Rs. 1642.38 lakh and Rs. 1581.89 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively. The above provision is made at about 1% of the cost of I- works to cover the establishment charges of the Accounts staff.

Abatement of Land Revenue: A provision of Rs. 83.0 lakh, Rs. 82.33 lakh and Rs. 60.93 lakh has been made under this sub-head for alternative (a), alternative (b)-I and alternative (b)-II respectively. The above provision is made at 5% of the land cost towards abatement of land revenue due to land acquisition for canals and camps.

11.6 Estimated cost

The total estimated cost of P.K.C. link canal project at price level 2002-03 works out to Rs.298902/-lakh, Rs.312547/- lakh and Rs.305830/- lakh for alternative (a), alternative (b)-I and alternative (b)-II respectively.