

CHAPTER-17

BENEFIT COST RATIO, FINANCIAL RETURN AND INTERNAL RATE OF RETURNS

17.1 INTRODUCTION

The purpose of the economic analysis is to assess the real costs and benefits without distortions to taxes, subsidies, quotas or other factors influencing the value of the products and services. The financial analysis is based not on economic values or shadow prices but on the prices observed on the market. In the analytical system followed for this project, the "with" and "without" situations are compared based on constant prices at current levels.

THE ASPECTS OF BENEFIT COST RATIO, FINANCIAL RETURN AND INTERNAL RATE OF RETURNS are dealt with exhaustively in the Irrigation Planning Volume-V under the following subjects.

- METHODOLOGY
- SITUATIONS "WITH & WITHOUT" PROJECT
- ASSUMPTIONS AND PARAMETERS
- BUILD-UP PERIOD FOR YIELDS AND BENEFITS
- IMPLEMENTATION SCHEDULE OF WORKS
- CONVERSION FACTORS
- STANDARD CONVERSION FACTOR (SCF)
- CONSTRUCTION CONVERSION FACTOR
- CONVERSION FACTOR FOR O & M COSTS
- FINANCIAL & ECONOMIC UNIT PRICES
- PROJECT BENEFITS
 - Direct benefits
 - Indirect Benefits
 - Crop Production & Value of Production
- COST ESTIMATE
- FINANCIAL ANALYSIS
- ECONOMIC ANALYSIS
- COMPUTATION OF BENEFIT COST RATIO

The details such as Name of the Crop, Area of the Crop and Yield per Hectare for the present cropped area with out project and with project are furnished below:

TABLE : 17.1 PRESENT CROPPED AREA (WITHOUT PROJECT)

Sl.No	Name of the Crop	Area of the Crop (Ha)	Average Yield (Q) per Ha.
1	Paddy	1055	12
2	Hybrid Maize	1980	10
3	Hybrid Sorghum	7600	10
4	GreenGram	1550	3
5	Pigeon pea	2670	5
6	Cotton	6830	8
7	Chillies	270	10
8	Vegetables	690	7
9	Soyabean	1655	8
	Total	24300	

TABLE : 17.2 PROPOSED CROPPED AREA (WITH PROJECT)

Sl.No	Name of the Crop	Area of the Crop (Ha)	Average Yield (Q) per Ha.
1	Paddy	9000	50
2	Hybrid Maize	8000	50
3	Hybrid Sorghum	6000	40
4	GreenGram	5000	20
5	Black Gram	2000	20
6	Pigeon pea	8000	25
7	Groundnut	3000	30
8	Cotton	14000	40
9	Chillies	12000	50
10	Vegetables	6000	60
11	Turmeric	3000	45
12	Soyabean	6000	40
13	Corriender	1335	45
	Total	83335	

Cropped Area in Kharif =	63335	Hectares
	156500	Acres
Cropped Area in Rabi =	20000	Hectares
	49420	Acres
Total Cropped Area =	83335	Hectares
	205920	Acres

• Value of Production

The value of crop production ("with" or "without" project) is likely to increase manifold from year 1 to year 7. The financial present value added for different years both under "without" and "with" Project situations are given in Table 17.3 and Table 17.4.

TABLE: 17.3 FINANCIAL PRESENT VALUE OF PRODUCTION(WITH OUT PROJECT)

Financial Present value of Production (with out Project) in Million Rs.

Sl.No	FINANCIAL IN MILLION Rs.						
	Crop	Area of the Crop (Ha)	Present Situation (with out Project)				
			Yield (Q/Ha)	Gross Value(Rs.)	Total Cost of Production (Rs.)	Net Return (Rs. Per Ha)	Total Net Return(Rs.)
1	Paddy	1055	12	16800	9450	7350	7754250
2	Hybrid Maize	1980	10	15000	8600	6400	12672000
3	Hybrid Sorghum	7600	10	11000	6450	6550	49780000
4	Green Gram	1550	3	18000	7950	10050	15577500
5	Pigeon pea	2670	5	40000	12550	27450	73291500
6	Cotton	6830	8	32000	19250	12750	87082500
7	Chillies	270	10	120000	51500	68500	18495000
8	Vegetables	690	7	21000	12700	8300	5727000
9	Soyabean	1655	8	28800	11600	17200	28466000
Total		24300					298845750
					Total in Millions		298.845

TABLE: 17.4 FINANCIAL PROPOSED VALUE OF PRODUCTION (WITH PROJECT)
FINANCIAL PRESENT VALUE OF PRODUCTION(WITH PROJECT) IN MILLION Rs.

Sl.No	FINANCIAL						
	Crop	Area of the Crop (Ha)	Present Situation (with Project)				
			Yield (Q/Ha)	Gross Value(Rs.)	Total Cost of Production (Rs.)	Net Return (Rs. Per Ha)	Total Net Return(Rs.)
1	Paddy	9000	50	70000	9150	60850	547650000
2	Hybrid Maize	8000	50	75000	6260	68740	549920000
3	Hybrid Sorghum	6000	40	44000	5450	38550	231300000
4	GreenGram	5000	20	120000	7050	112950	564750000
5	Black Gram	2000	20	240000	17770	222230	444460000
6	Pigeon pea	8000	25	200000	15800	184200	1473600000
7	Groundnut	3000	30	360000	30450	329550	988650000
8	Cotton	14000	40	160000	37850	122150	1710100000
9	Chillies	12000	50	600000	74350	525650	6307800000
10	Vegetables	6000	60	180000	20440	159560	957360000
11	Turmeric	3000	45	382500	59860	322640	967920000
12	Soyabean	6000	40	144000	20600	123400	740400000
13	Corriender	1335	45	180000	17350	162650	217137750
Total		83335	83335				15701047750
						Total in Millions(Rs)	15701.04775

Financial Value of Produce for the crop Ayacut ..

a) Kharif Crop = 63335 Hectares / 156500 Acres
b) Rabi Crop = 20000 Hectares / 49420 Acres
Total Cropped Area = 83335 Hectares / 205920 Acres
Financial Value of Produce for the cropped ayacut of 83,335 Hectares = Rs. 15701.04 Millions

17.2 COST ESTIMATE

- **Investment Cost**

The total investment cost of the project is Rs.6,205 Crores. (Barrage and Main canals cost Rs.42.05 Cr and Distributory network including Balancing reservoirs, pump house, pressure mains etc., cost approximately Rs.2000 Cr) These include, besides the cost of irrigation/engineering, provision for administrative and physical conditions, construction supervision, equipment repairs and procurement, machineries and environmental provision etc.

The economic costs of the project are derived from the financial costs by using the weighted conversion factors as described in section 13.6 for different types of works and services.

- **O&M Costs**

The operation and maintenance costs include the estimated expenditures for the maintenance of structures, infrastructures, equipment and running costs of pumps and their periodical replacements. The economic costs of annual O & M for different goods and services for the project are derived from financial O & M costs by using the weighted economic conversion factor.

17.3 FINANCIAL ANALYSIS

- **Financial Analysis**

Project analysis has been carried out to cover a total period of 100 years from the year of the start of the construction of the project. The year wise net incremental return in the "with" project situation over "without" project situation has been computed as under.

Net Incremental Return = Net return in "with" Project situation minus Net return in the "without" Project situation.

The flow of costs and benefits has been discounted at base discount rates (8%) to formulate discounted cash flow streams. The FIRR i.e. discount rate, at which with the stream of cash flow, will give zero Net Project Value or Net Project Value tends to zero at the end year of the evaluated period. The Financial Internal Rate of Return (FIRR) for this project is found to be 10.32 % percent and NPV value at 12% discount rate.

17.4 ECONOMIC ANALYSIS

The Economic Internal Rate of Return (EIRR) produced by the 100 year net cash flow is 12.85% percent and NPV value at 12% discount rate.

17.5 COMPUTATION OF BENEFIT COST RATIO

17.5.1 Cost of Dr.B.R.Ambedkar Pranahita Sujala Sravanthi for Computation Of Benefit Cost Ratio

Dr.B.R.Ambedkar Pranahita Sujala Sravanthi project envisages diversion of 20 TMC of water by constructing a barrage across River Pranahita, a major tributary to River Godavari. It is contemplated to irrigate a command area of 63,335 hectares in drought prone areas of east Adilabad district of Telangana state.

**COST OF THE DR. B.R.AMBEDKAR PRANAHITA SUJALA SRAVANTHI
CONSIDERED FOR WORKING OUT THE BENEFIT-COST RATIO IS Rs. 6,205.00
CRORES**

17.5.2 The Present cropped area (with out Project) are 24,300 Hectares / 60,045 Acres. The details are appended in Table 17.5

17.5.3 The entire ayacut of 63,335 Hectares/ 1,56,500 Acres is proposed for Kharif and an ayacut of 20,000 Ha/49,420 Acres is proposed for Rabi.The details are appended in Table 17.6

The Intensity of Irrigation is $(20,000/63,335) \times 100 = 31.58\%$

17.5.4 The Financial value of production **without** project is worked out to be Rs. 298.845 Millions. The Details shown in Table 17.3. The financial Value of Production **with** project is worked out to be Rs.15701.04 Millions. The details are appended in Table 17.4.

17.5.5 Computation of Benefit Cost Ratio:

The Benefit cost Ratio is computed with the above benefits and costs. The details are appended in Table 17.10

The Benefit Cost Ratio works out to be 1.70

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