Feasibility Analysis and Risk Mitigation of an Infrastructure Project – A Case study on Irrigation project

R. R. Bhosale[1], A. P. Waghmare[2]
[1, 2] Department of Civil Engineering
[1, 2] Dr. D Y Patil School of engineering & Technology, Lohgaon pune

Abstract- *Investment in construction project is able to give higher benefit beside of its high uncertainty. The uncertainty depends on many factors. The influence of the identified Factors then has to be evaluated and calculated towards the project feasibility. Before investment, the feasibility of the project has to be done that gives figures of cash flow during the project duration. This can be one of the considerations for making a decision whether this project is feasible or not. For a construction project, it is very important to take into consideration the various risks involved in the project at various stages while assessing the technical and financial feasibility of the project.*

Keywords- B/C Ratio, Feasibility Analysis, Irrigation Projects, Socio Economic Aspects.

I. INTRODUCTION

A comprehensive feasibility study is the basis for the decision makers to decide whether to support or reject the project at an initial stage. The result of a feasibility study shows the preferred solution which is technically and institutionally feasible, financially viable, socio- culturally acceptable and economically justified. A feasibility report is a part of Initial Project Report (IPR) prepared to present an in-depth techno-economic analysis carried out on the projects and contains results of technical as well as economic evaluation of the projects so that the owner can take investment decisions and the projects can be properly planned and implemented. The result of this analysis shows a detailed technical, economic and financial analysis which is necessary for the feasibility study of a project.

II. BASIC ASPECTS OF FINANCIAL ANALYSIS

A) PROJECT COST

The cost of the project is estimated to be Rs. 21091.79 lakhs

The summary breakup of project cost is given below:

TABLE 1: SUMMARY BREAK-UP OF PROJECT COST

PARTICULARS	Amount (Rs in lakhs)
A) DIRECT CHARGES	21095.54
B) DEDUCTIONS	3.75
C) INDIRECT CHARGES	180.95
D) TOTAL	21272.74

The project is to be financed by government corporation and therefore it is presumed that this much amount of fund is made available from the financial planning of the state government corporation.

B) MEANS OF FINANCE

The project comes under the state government authority and as a separate department and corporation have been setup for the similar type of projects, therefore the funding of the project is entirely done by the water resources department of the state government.

TABLE 2 : MEANS OF FINANCE

MEANS OF FINANCE	AMOUNT (Rs. LAKHS)
Government Grants	21272.74
Total Project Cost	21272.74

C) B.C.RATIO AND FINANCIAL RETURNS

Data:

Net project cost = Rs. 21272.74 lakhs
Catchment Area = 4061 Ha
Project Cost = Rs.523830.09/Ha

The cost of the Irrigation project is considered to work out annual cost of the project with following assumptions,

(i) Simple intrest @ 10% on capital cost of project.
(ii) Depreciation charges @ 1% (excluding cost of rising main & pumping system)
(iii) Depreciation of pumping system @ 8.33% of pumping cost
(iv) Depreciation of rising main @ 3.33% of rising main cost
(v) Power charges for LIS @ 0.3/unit
(vi) Annual maintenance charges @ 1% of cost of headwork .

Benefits Cost Ratio Analysis:

Benefits				
A)	(i)	Cost of the project	Rs.(lakhs)	21272.74
	(ii)	Cost of LIS for Satgaon pathar	Rs.(lakhs)	572.53
		Total	Rs.(lakhs)	21845.27
B)	(i)	Gross value of irrigation produces for satgaon pathar area and command area (Rs. 841.92 lakhs/1000 ha for 5065 ha)	Rs.(lakhs)	4264.32
	(ii)	Add: benefit on a/c of drinking water (Drinking water planning provision of 5.49 cum, total benefits from drinking water is @ Rs. 8.70/10000 lit.)	Rs.(lakhs)	47.76
	(iii)	Add: benefit for balanced water 30.29 cum releaed in chaskaman dam by drinking water @ Rs. 8.70/10000 lit.	Rs.(lakhs)	263.5
		Total	Rs.(lakhs)	4575.58
(C)	(i)	Loss of agriculture produce from area under submergence	Rs.(lakhs)	34.95
	(ii)	Construction cost of old structures under submergence	Rs.(lakhs)	10
		Total	Rs.(lakhs)	44.95
Total Annual Benefit			Rs.(lakhs)	4530.64

Table 3: Total Annual Benefit

Costs				
(D)	(i)	Interest charges @ 10% of 21845.27	Rs.(lakhs)	2184.53
	(ii)	Depreciation @ 1% on cost of A less cost of work for pumping system (21845.27-(4122.79+1186.94) = 16533.54)	Rs.(lakhs)	165.34
	(iii)	Depreciation of pumping system @ 8.33 % (4122.79)	Rs.(lakhs)	343.43
	(iv)	Depreciatio of cost of rising main @ 3.33% (1188.94)	Rs.(lakhs)	39.59
	(v)	Power charges of LIS @ Rs. 0.3/ unit, consumption-15946352 unit	Rs.(lakhs)	47.84
	(vi)	Power consumption	Rs.(lakhs)	16.23
	(vii)	Fuel charges	Rs.(lakhs)	65.38
	(viii)	Annual maintenance @ 1% of cost of head works (11737.14)	Rs.(lakhs)	117.37
	(ix)	Administrative charges of Rs 100 per Ha for CCA 5625 Ha	Rs.(lakhs)	5.63
		Total Annual Cost	Rs.(lakhs)	2985.34

Table 4 : Total Annual Cost

Hence,

$$\text{B-C Ratio} = \frac{\text{Total Annual Benefit}}{\text{Total Annual Cost}}$$

$$= \frac{4530.64}{2985.34}$$

$$= 1.52$$

III. SOCIO ECONOMIC ASPECTS

There are no industries in and near about the command area of the project and hence present employment potential is very rear as compared to the population. The main source of livelihood in this area is agriculture. The existing production of crops per hector, in the command area of the

project is rather low, due to uncertain rainfall, as compared to production in the area in the neighbouring region. There are no minor irrigation tanks existing or proposed in or in adjacent to the catchment area or the command area of the project.

IV. SUMMARY

The financial analysis covers project cost, Means of finance, Net project cost, Benefit cost ratio. The data collected gives all the basic entities to work out the B/C ratio, the analysis for the same have been done and it has been achieved.

V. INFERENCE

The benefit cost ratio of the scheme works out to 1.52 which is more than 1.5 as prescribed for medium projects. The scheme will improve socio economic condition due to employment, small scale industries, poultry and other supplementary works of areas by providing irrigation facilities.

VI. CONCLUSION

Thus the project falls under acceptable criteria from Benefit Cost Analysis. Working cost of the scheme definitely increases year to year. As compared to this, benefits of crops do not increase because those are fluctuating and depends upon demand and supply. Due to increase in food grain prices of some commodities are likely to shoot down in future. This affects economic viability of the scheme. However, green revolution is a need of the time. Water is precious, water is life, hence by all means we have to harness available water resources and use it properly where it is needed. So apart from BC ratio, keeping in mind all other indirect benefits etc and to have social justice as a moral binding of government, this scheme is in benefit of public purpose.

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