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Financial Analysis of Infrastructure Project - A Case Study on Built-Operate-Transfer Project in India

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Abstract - The build operate transfer scheme can be advantageously adopted by administrations in India for implementing transport infrastructure projects, such as the construction of bridges, road without undue strain on their declining budgetary resources relating to the toll structure, toll revision schedule, extent of the grant, and duration of the concession period. Feasibility report is prepared during the initial phase or definition phase of the project. Updating and validation of the feasibility report is required for implementation of the project. the project can be implemented as per techno economics stipulation made in the feasibility report. A feasibility report is prepared to present an in-depth techno economic analysis carried out on the project and contain result of technical as well as economic evaluation of the project so that the owner can take investment decision and the project can be properly planned and implemented .

The viability of any project mainly depend on the technical analysis, financial analysis, economic analysis, ecological analysis. Hence it can be very well understood that feasibility study is the base for the success of a project and the major part of this success lies in proper financial analysis.
Financial analysis is useful for every business entity to enhance their performance, competitive strength and access their financial stability and profitability of the firm. This paper investigates the financial analysis of the BOT project.

Keywords: BOT Infrastructure projects, profitability statement, cash flow statement, DSCR, payback period.

3. INTRODUCTION:

The process of evaluating businesses, projects, budgets and other finance-related entities to determine their suitability for investment. Typically, financial analysis is used to analyze whether an entity is stable, solvent, liquid, or profitable enough to be invested in. When looking at a specific company, the financial analyst will often focus on the income statement, balance sheet, and cash flow statement. In addition, one key area of financial analysis involves extrapolating the company's past performance into an estimate of the company's future performance.In this part of analysis- The particulars of the project cost are studied The combination of Means of finance is also studied The financial data in the concession agreement have been studied and cashf low projections have been made The result of this analysis shows the preferred solution which financially feasible and viable and economically justified.

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4. BASIC PARAMETERS FOR FINANCIAL ANALYSIS

4.1. PROJECT COST

The cost of the project is estimated to be **Rs 880.00 cr.**

The summary break-up of project cost is given below:

PARTICULARS	AMOUNT (RS. CR)
EPC and Directly related Costs	727.85
Preliminary & Pre-operative Expenses	39.76
Interest During Construction	76.08
Interest upto first annuity payment date	36.30
Total Project Cost	**880.00**

As the first annuity payment would be made 6 months after the scheduled project completion date, a provision for funding the first six months of interest cost has been made as part of the Project Cost.

4.2. MEANS OF FINANCE

The project-funding requirement shall be met from a combination of promoters' contribution, Government Grant and term loans. It is proposed to finance the project at a Debt Equity Ratio (DER) of 3:1. The means of finance for the project is as tabulated below:

MEANS OF FINANCE	AMOUNT(RS.CR)
Government Grant	141.55
Equity/Quasi equity	78.45
Debt	660.00
Total Project Cost	880.00

NHAI will part finance the project by way of a Grant, which would be 20% of the bid project cost. To facilitate early commencement of work, first installment of 35% of the Grant shall be paid upfront on the Commencement Date against Bank Guarantee.

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NHAI shall pay the other installments of Grant to the Concessionaire linking up with the satisfactory achievement of project milestones.

4.3. FINANCIAL DATA FROM CONCESSION AGREEMENT

- Net project cost = 738.45 crores
- Discounting factor – 12%
- Debt-Equity Ratio – 3:1
- Subsidy – 20% of the bid project cost
- Annuity Payments – 69.30 crores, semi annually
- Total Project cost includes construction cost, Operation and maintenance costs of roads and bridges/structures with all components.
- Construction period – 30 months (2009-2012)
- Concession period – 22 years

First annuity payment would be made 6 months after scheduled project completion date

Construction phasing

1st Year - 25%
2nd Year - 40%
3rd Year - 35%

Total project cost is 880.00 cr.

Cost of construction for 1st year =0.25*880.00 =220.00 CR
Cost of construction for 2nd year =0.4*880.00 =352.00 CR
Cost of construction for 3rd year =0.35*880.00 = 308.00 CR

Assumptions:

Interest on debt – 11% per annum
Cost of equity – 14%
Depreciation – 5%
Income tax – 33%

4.4. FINANCING ARRANGEMENT IN THE CONCESSION AGREEMENT:

- Financial Closure: The Concessionaire shall achieve Financial Close within 90 days from the date of CA.

Escrow Account: The CA provides for opening of an Escrow Account by the Concessionaire with a Bank within 60 days from the date of CA and all funds constituting the financing package be credited to the account The Concessionaire shall deposit cash-flows from the Project into the account, the proceeds from which shall be appropriated in the order of all taxes and payble,all expenses related to project construction,O&MExpenses,1/12(one twelfth) of the annual libility on this account,the whole or part of expenses on repair work.

Year	Revenue		Total O&M Cost (@26.27%)	Net operating Income	Amount Of loan (DEBT)	Interest @ 11%	Principal Repayment	Profit After Interest	Depre. @ 5%	Profit / Loss Before tax (PBT)	Service tax @ 11.2	INCOME TAX @ 33%	Profit / Loss After tax (PAT)
	Gross Revenue	Net Revenue											
2009	139	139	36.40	102.20	660.00	72.60	30.00	29.60	36.39	-6.80	0.00	0	-6.80
2010	139	139	36.40	102.20	630.00	69.30	30.00	32.90	36.39	-3.50	0.00	0	-3.50
2011	139	139	36.40	102.20	600.00	66.00	30.00	36.20	36.39	-0.20	0.00	0	-0.20
2012	139	139	36.40	102.20	570.00	62.70	30.00	39.50	36.39	3.10	0.35	0	2.75
2013	139	139	36.40	102.20	540.00	59.40	30.00	42.80	36.39	6.40	0.72	0	5.68
2014	139	139	36.40	102.20	510.00	56.10	30.00	46.10	36.39	9.70	1.09	0	8.61
2015	139	139	36.40	102.20	480.00	52.80	30.00	49.40	36.39	13.00	1.46	0	11.54
2016	139	139	36.40	102.20	450.00	49.50	30.00	52.70	36.39	16.30	1.83	0	14.47
2017	139	139	36.40	102.20	420.00	46.20	30.00	56.00	36.39	19.60	2.20	0	17.40
2018	139	139	36.40	102.20	390.00	42.90	30.00	59.30	36.39	22.90	2.57	0	20.33
2019	139	139	36.40	102.20	360.00	39.60	30.00	62.60	36.39	26.20	2.94	8.65	14.62
2020	139	139	36.40	102.20	330.00	36.30	30.00	65.90	36.39	29.50	3.31	9.74	16.46
2021	139	139	36.40	102.20	300.00	33.00	30.00	69.20	36.39	32.80	3.68	10.83	18.30
2022	139	139	36.40	102.20	270.00	29.70	30.00	72.50	36.39	36.10	4.05	11.91	20.14
2023	139	139	36.40	102.20	240.00	26.40	30.00	75.80	36.39	39.40	4.42	13.00	21.98
2024	139	139	36.40	102.20	210.00	23.10	30.00	79.10	36.39	42.70	4.79	14.09	23.82
2025	139	139	36.40	102.20	180.00	19.80	30.00	82.40	36.39	46.00	5.16	15.18	25.66
2026	139	139	36.40	102.20	150.00	16.50	30.00	85.70	36.39	49.30	5.53	16.27	27.50

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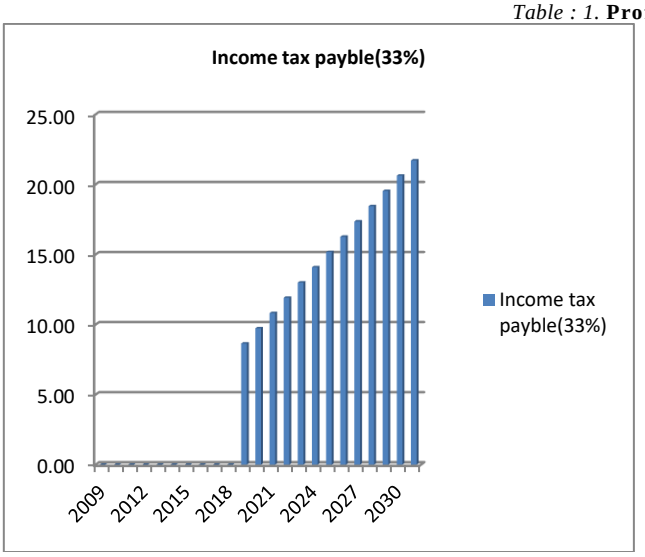
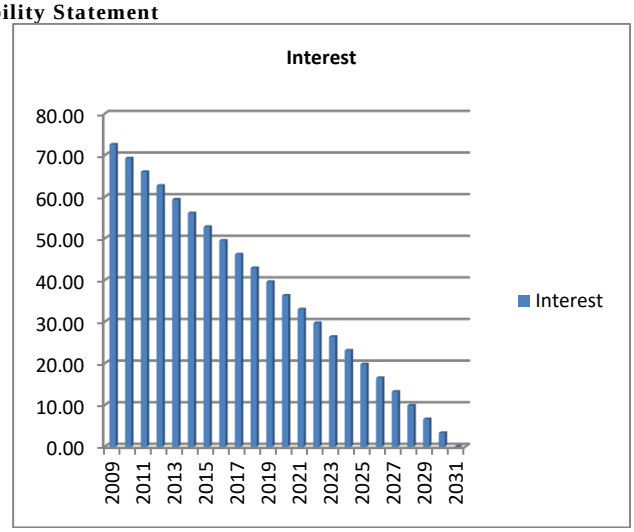
2027	139	139	36.40	102.20	120.00	13.20	30.00	89.00	36.39	52.60	5.90	17.36	29.34
2028	139	139	36.40	102.20	90.00	9.90	30.00	92.30	36.39	55.90	6.27	18.45	31.18
2029	139	139	36.40	102.20	60.00	6.60	30.00	95.60	36.39	59.20	6.64	19.54	33.02
2030	139	139	36.40	102.20	30.00	3.30	30.00	98.90	36.39	62.50	7.01	20.63	34.86
2031	139	139	36.40	102.20	0.00	0.00	30.00	102.20	36.39	65.80	7.38	21.72	36.70

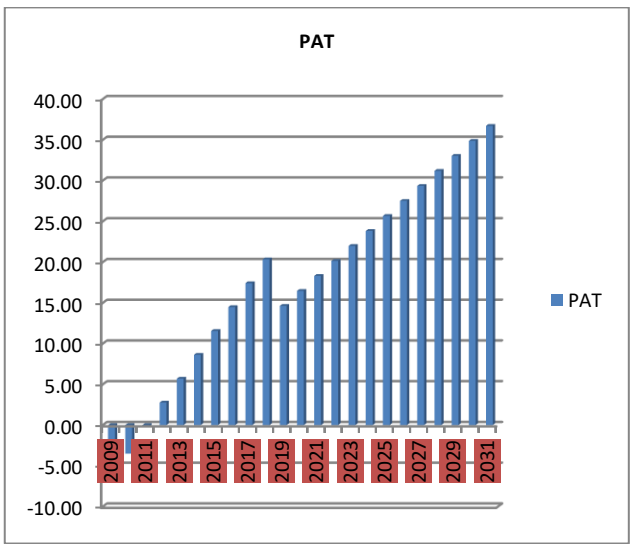
Table : 1. **Profitability Statement**



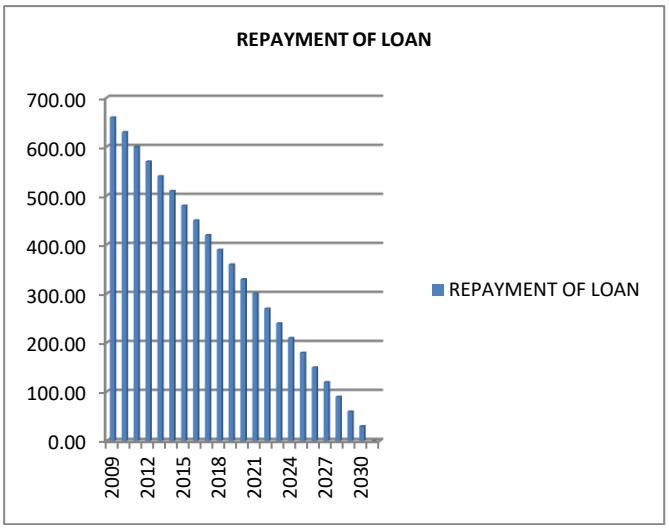
Graph 1 : **Income tax Payable**



Graph 3 : **Interest payable**



Graph 2 : **Profit After Tax**



Graph 4 : **Repayment Of Loan**

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Year	Cash Inflow			Cash Outflow		Net Cashflow	Cummulative Cashflow
	Profit / Loss After tax (PAT)	Add:Depr	Total Inflow	Loan Repayment	Total Outflow		
2009	-6.80	36.39	29.60	30.00	30.00	-0.40	-0.4
2010	-3.50	36.39	32.90	30.00	30.00	2.90	2.5
2011	-0.20	36.39	36.20	30.00	30.00	6.20	8.7
2012	2.75	36.39	39.15	30.00	30.00	9.15	17.8
2013	5.68	36.39	42.08	30.00	30.00	12.08	29.9
2014	8.61	36.39	45.01	30.00	30.00	15.01	44.9
2015	11.54	36.39	47.94	30.00	30.00	17.94	62.9
2016	14.47	36.39	50.87	30.00	30.00	20.87	83.7
2017	17.40	36.39	53.80	30.00	30.00	23.80	107.5
2018	20.33	36.39	56.73	30.00	30.00	26.73	134.2
2019	14.62	36.39	51.01	30.00	30.00	21.01	155.3
2020	16.46	36.39	52.85	30.00	30.00	22.85	178.1
2021	18.30	36.39	54.69	30.00	30.00	24.69	202.8
2022	20.14	36.39	56.53	30.00	30.00	26.53	229.3
2023	21.98	36.39	58.37	30.00	30.00	28.37	257.7
2024	23.82	36.39	60.21	30.00	30.00	30.21	287.9
2025	25.66	36.39	62.05	30.00	30.00	32.05	320.0
2026	27.50	36.39	63.89	30.00	30.00	33.89	353.9
2027	29.34	36.39	65.73	30.00	30.00	35.73	389.6
2028	31.18	36.39	67.58	30.00	30.00	37.58	427.2
2029	33.02	36.39	69.42	30.00	30.00	39.42	466.6
2030	34.86	36.39	71.26	30.00	30.00	41.26	507.8
2031	36.70	36.39	73.10	30.00	30.00	43.10	550.9

Table2 : **Cash flow**

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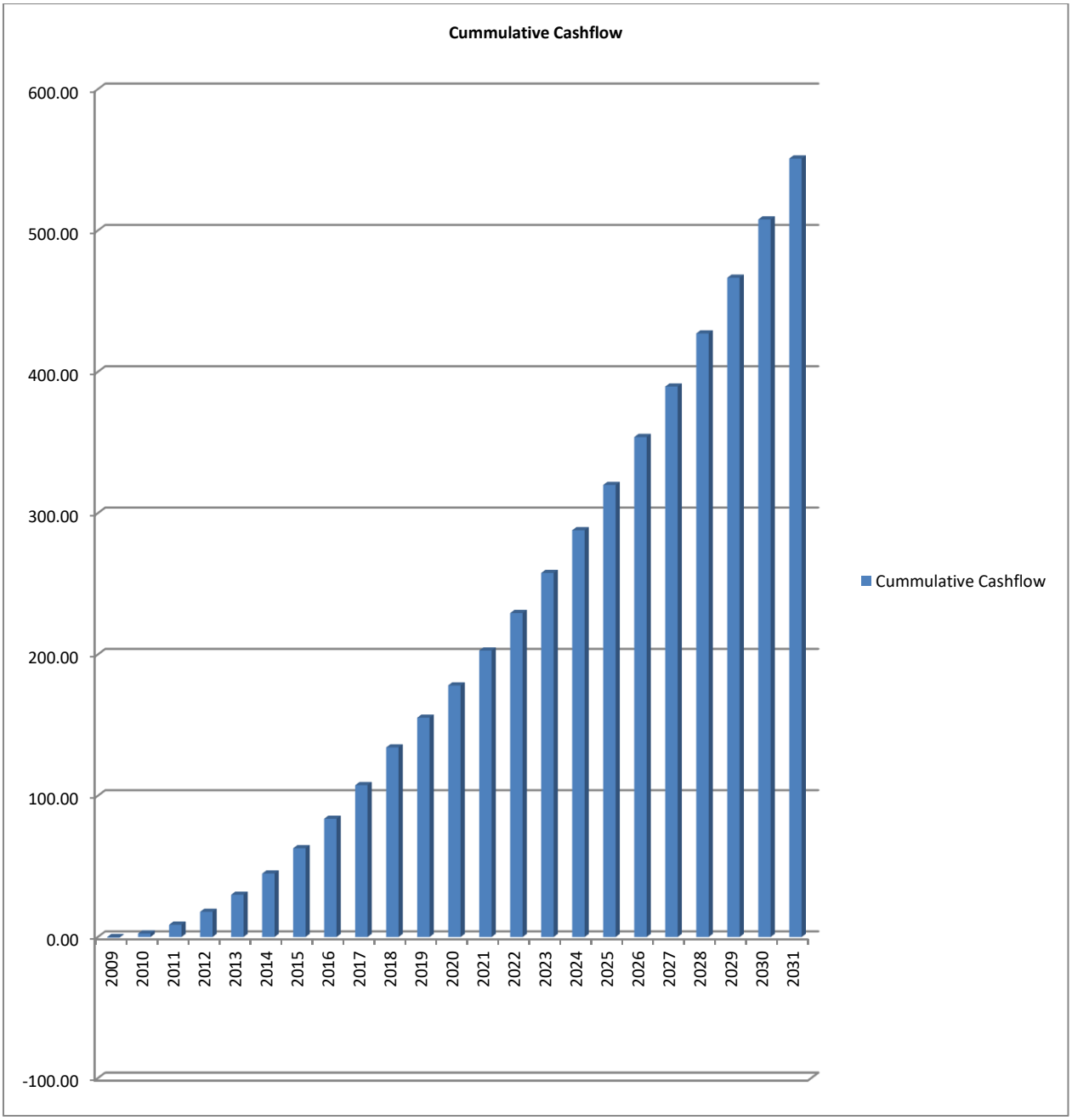

Graph 5 : **Cumulative Cash flow**

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Year	Cash Inflow				Cash Outflow			DSCR
	Profit / Loss After tax (PAT)	Add:Depre.	Interest	Total	Loan Repay ment	Interest	Total	
2009	-6.80	36.39	72.60	102.20	30.00	72.60	102.60	1.00
2010	-3.50	36.39	69.30	102.20	30.00	69.30	99.30	1.03
2011	-0.20	36.39	66.00	102.20	30.00	66.00	96.00	1.06
2012	2.75	36.39	62.70	101.85	30.00	62.70	92.70	1.10
2013	5.68	36.39	59.40	101.48	30.00	59.40	89.40	1.14
2014	8.61	36.39	56.10	101.11	30.00	56.10	86.10	1.17
2015	11.54	36.39	52.80	100.74	30.00	52.80	82.80	1.22
2016	14.47	36.39	49.50	100.37	30.00	49.50	79.50	1.26
2017	17.40	36.39	46.20	100.00	30.00	46.20	76.20	1.31
2018	20.33	36.39	42.90	99.63	30.00	42.90	72.90	1.37
2019	14.62	36.39	39.60	90.61	30.00	39.60	69.60	1.30
2020	16.46	36.39	36.30	89.15	30.00	36.30	66.30	1.34
2021	18.30	36.39	33.00	87.69	30.00	33.00	63.00	1.39
2022	20.14	36.39	29.70	86.23	30.00	29.70	59.70	1.44
2023	21.98	36.39	26.40	84.77	30.00	26.40	56.40	1.50
2024	23.82	36.39	23.10	83.31	30.00	23.10	53.10	1.57
2025	25.66	36.39	19.80	81.85	30.00	19.80	49.80	1.64
2026	27.50	36.39	16.50	80.39	30.00	16.50	46.50	1.73
2027	29.34	36.39	13.20	78.93	30.00	13.20	43.20	1.83
2028	31.18	36.39	9.90	77.48	30.00	9.90	39.90	1.94
2029	33.02	36.39	6.60	76.02	30.00	6.60	36.60	2.08
2030	34.86	36.39	3.30	74.56	30.00	3.30	33.30	2.24
2031	36.70	36.39	0.00	73.10	30.00	0.00	30.00	2.44
Avg. DSCR								**1.35**

Table 3: **Calculation of DSCR**

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Year	PAT	Depre.	Total Cash Inflow	Disc factor @ 12%	PV Of Cash Inflow	Total Cash Outflow	WACC @ 11.32%	PV of Cash Outflow
2009	-6.80	36.39	29.60	0.89	26.42	30.00	0.90	26.95
2010	-3.50	36.39	32.90	0.80	26.22	30.00	0.81	24.21
2011	-0.20	36.39	36.20	0.71	25.76	30.00	0.72	21.75
2012	2.75	36.39	39.15	0.64	24.88	30.00	0.65	19.54
2013	5.68	36.39	42.08	0.57	23.88	30.00	0.58	17.55
2014	8.61	36.39	45.01	0.51	22.80	30.00	0.53	15.76
2015	11.54	36.39	47.94	0.45	21.68	30.00	0.47	14.16
2016	14.47	36.39	50.87	0.40	20.54	30.00	0.42	12.72
2017	17.40	36.39	53.80	0.36	19.40	30.00	0.38	11.43
2018	20.33	36.39	56.73	0.32	18.26	30.00	0.34	10.27
2019	14.62	36.39	51.01	0.29	14.66	30.00	0.31	9.22
2020	16.46	36.39	52.85	0.26	13.57	30.00	0.28	8.28
2021	18.30	36.39	54.69	0.23	12.53	30.00	0.25	7.44
2022	20.14	36.39	56.53	0.20	11.57	30.00	0.22	6.68
2023	21.98	36.39	58.37	0.18	10.66	30.00	0.20	6.01
2024	23.82	36.39	60.21	0.16	9.82	30.00	0.18	5.39
2025	25.66	36.39	62.05	0.15	9.04	30.00	0.16	4.85
2026	27.50	36.39	63.89	0.13	8.31	30.00	0.15	4.35
2027	29.34	36.39	65.73	0.12	7.63	30.00	0.13	3.91
2028	31.18	36.39	67.58	0.10	7.01	30.00	0.12	3.51
2029	33.02	36.39	69.42	0.09	6.43	30.00	0.11	3.16
2030	34.86	36.39	71.26	0.08	5.89	30.00	0.09	2.83
2031	36.70	36.39	73.10	0.07	5.39	30.00	0.08	2.55
Total PV					**352.37**	**NPV**		**242.52**

Table 4: **Calculation of NPV**

NPV = Cash inflow - Cash Outflow = 352.37 - 242.52 = Rs. 109.85 Crores

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4.5. PROJECTED CASH FLOW STATEMENTS

The annuity scheme of NHAI provides an incentive to private sector development and operations of select roads wherein the operator receives a fixed semi-annual annuity payment towards operations cost and recovery of investment over the concession period.

Payback period = Cost of the project/ Cash inflows in one year

= 880.00/139 = **6.33 years i.e. Payback period is in between 6th - 7th year**

5. SUMMARY

The financial analysis covers total project cost, means of finance, cost of finance and operating results for the life of the project. The concession agreement gives the basic data necessary to analyze all the above. The analysis has been done and the following have been generated

- Profitability statement
- Cash flow statement

These again form input for calculation of NPV and DSCR. Thus the NPV and DSCR are calculated. Apart from this under the non-discounting method of project appraisal, the payback period is calculated.

6. INFERENCE

The following results have been inferred
5.1 NPV is positive.
5.2 Debt Service coverage ratio is 1.35. So the project could service scheduled repayments during its life cycle.
So the project is acceptable from investment criteria and also acceptable by lenders.

7. CONCLUSION

Thus now that the project falls under the financially acceptable. Municipal administrations in India, as in many other developing countries, can advantageously apply the BOT scheme to implement public infrastructure projects, such as the construction of bridges, without increasing the sovereign debt. Government may contribute financial assistance to the project by way of an outright grant. The financial model described in this paper facilitates the study of the financial viability of a BOT project as affected by various options relating to the toll structure, toll revision schedule, extent of government grant, and the duration of the concession period, as demonstrated by the case study. By careful consideration of the results of the financial study, the project sponsor and the project promoter can arrive at a reasonable agreement on the sharing of risks and the terms of the concession.

8. REFRANCES

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