Project Financial and Economic Analysis Report

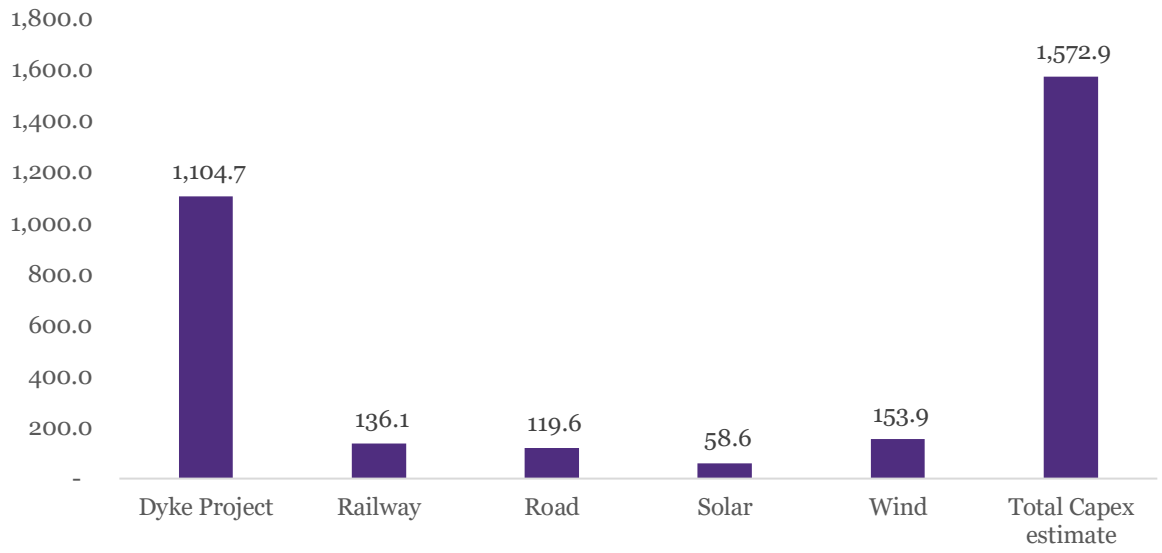
When considering a large-scale infrastructure project, it is crucial to conduct a thorough **financial and economic viability analysis**. This analysis helps decision-makers understand whether the project will generate sufficient returns and benefits compared to its costs. It ensures that the project not only generates profits but also creates long-term value for the economy as a whole.

- **Financial analysis** focuses on understanding how much money the project will make compared to how much it costs. It includes looking at the revenues generated by the project, the costs involved, and whether the project will result in a net financial gain over time.
- **Economic analysis** goes beyond the direct financial returns and considers the broader benefits to society, such as job creation, time savings, and environmental improvements. It evaluates whether the project contributes positively to the overall economy.

Both types of analysis are critical in determining whether a project is worth pursuing, especially when public funds or large-scale investments are involved.

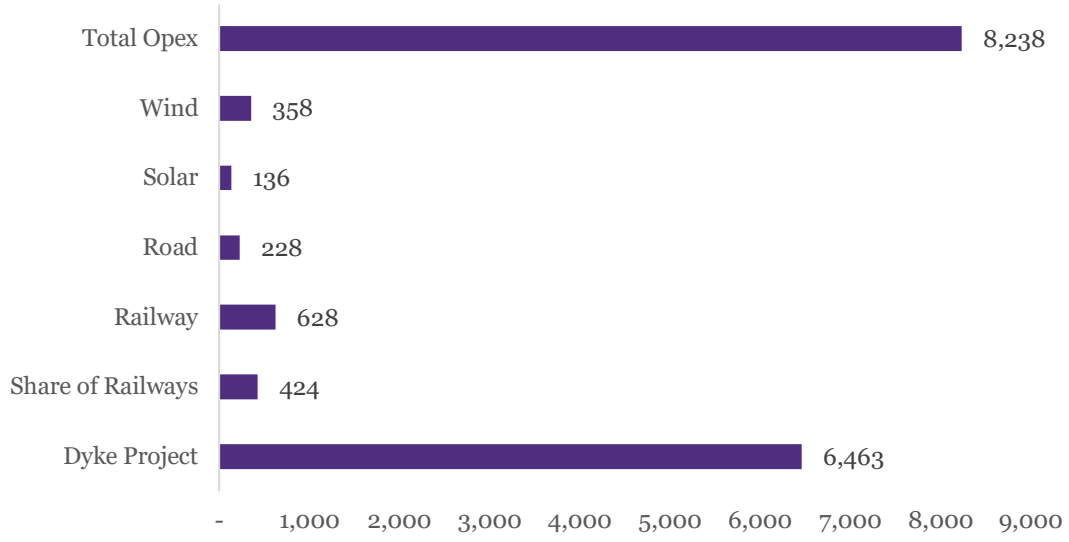
Additionally, to make the analysis more understandable, it can be helpful to break the project into simpler terms, like examining how every ₹100 spent is distributed throughout the project's lifecycle. When we do this, it's important to consider the **present value** of money, which adjusts for inflation. In this case, we assume a long-term inflation rate of 5% to convert the operations and maintenance costs into their present value.

1. Project Cost Overview (Rs. Billion)



The overall project cost is estimated to be Rs. 1572.9 billion phased over a eight year period with the Dyke Project costing the maximum at Rs. 1,104.7 billion. The Dyke cost is inclusive of the cost of Flood Regulator as well as Narmada Diversion cost (of Rs. 7.96 billion). Other project costs estimated by various agencies include cost of the Railway project which is Rs. 136.1 billion, the Road project Rs. 119.6 billion, and the Renewable Energy Projects with a combined total of Rs. 212.5 billion.

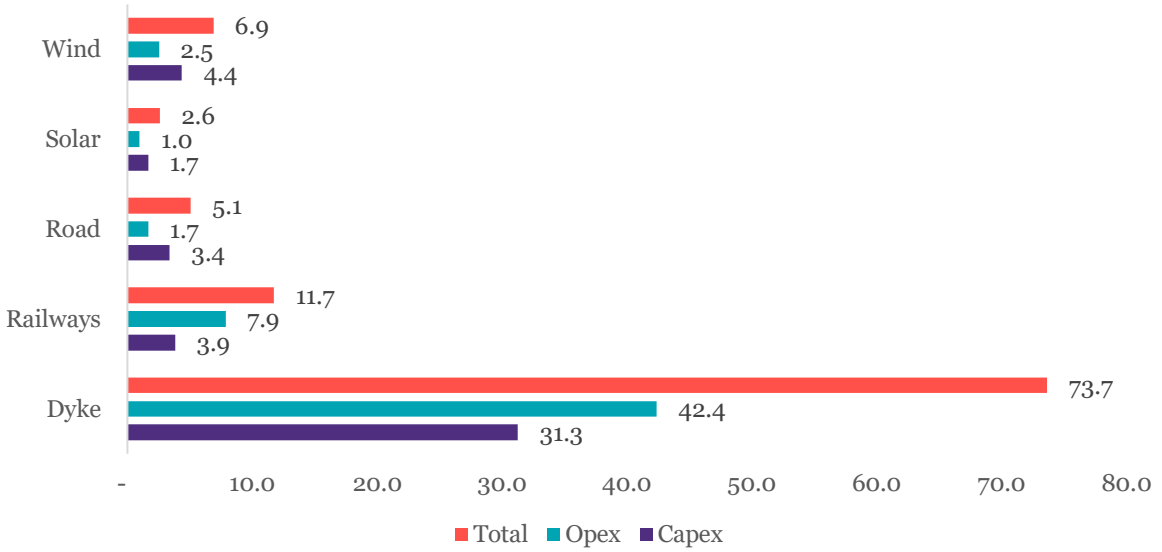
2. Operations and Maintenance Costs - Cumulative Operations and Maintenance (Opex) Costs over 50 Years (Rs. Billion):



Operations and maintenance costs have been arrived at following inputs from sectoral experts, following industry trends as in the case of Renewable Energy projects and incorporating historical trends observed in similar projects globally. As can be observed, majority of the expenses are incurred in operations and maintenance of the Dyke Project. These are cumulative expenses incurred over the 50-year project period and takes into account possible inflation and consequent year-on-year increase in operating costs.

3. Accounting for Every ₹100 Spent

To make the project easier to understand, we've broken down how every ₹100 is spent:



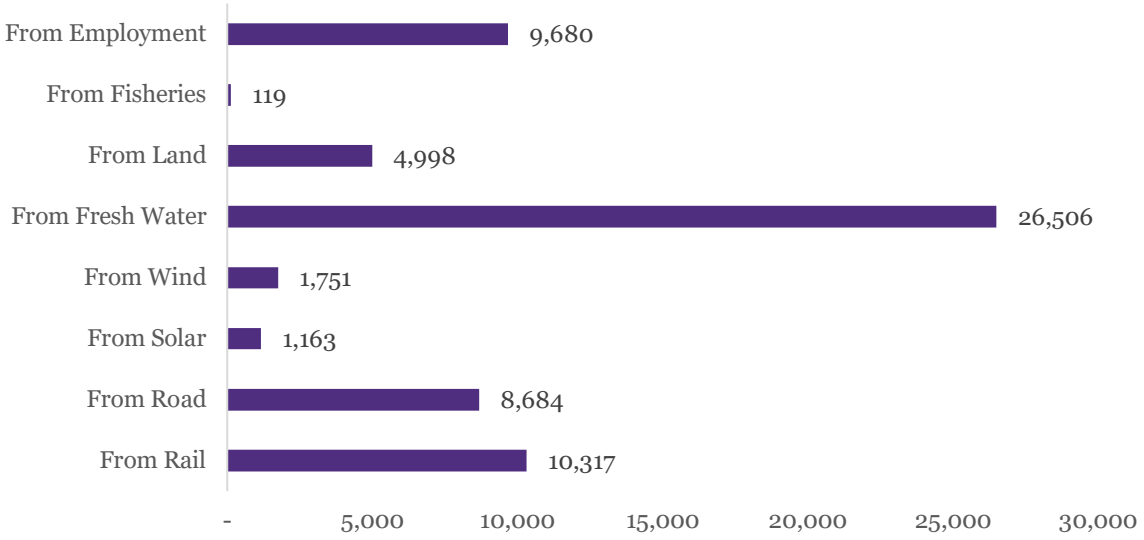
True to the nature of expenses, close to Rs. 74 out of every Rs. 100 spent on the project over the entire project life cycle is incurred towards construction, operations and maintenance of the Dyke Project and the Flood regulator (as well as the Narmada Diversion Project). The balance amount of Rs. 26 out of every Rs. 100 is incurred on the other projects.

Note: These Opex costs have been adjusted to present value terms, considering an estimated inflation rate of 5% over the project lifecycle.

Why Present Value is Used:
We use the present value instead of nominal values because money today is worth more than money in the future. By converting costs and revenues to present value, we get a clearer picture of the real financial performance of the project, accounting for inflation over time.

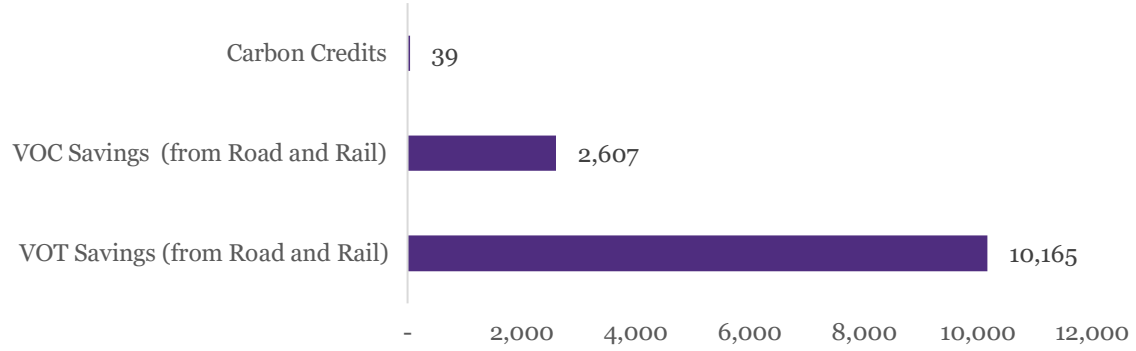
4. Revenue Generation

Total Revenue (Rs. Billion): The total revenue generated across various sectors is estimated at Rs. 63,218 billion. Breakdown by sector:



5. Other Economic Benefits

Total Economic Benefits (Rs. Billion): Rs. 12,811 billion. This includes:



These represent the other economic benefits which are over and above the Financial benefits which accrue as revenue generated from the various projects.

Over here, these include:

- **Vehicle Operating Cost**: Changes in the costs of owning and operating vehicles (trucks as well as cars) resulting from a transportation improvement project are counted as benefits or disbenefits.
- **Vehicle Operating Time**: Refers to the cost of time spent on transport. It includes costs to businesses of the time their employees and vehicles spend on travel, and costs to consumers of personal (unpaid) time spent on travel. VOT savings refers to the benefits from reduced travel time costs.
- **Carbon Credits**: Carbon credits can be produced by a variety of activities that avoid GHG emissions or enhance carbon removals. In the instant case, carbon credits are generated as a direct consequence of the VOC and VOT benefits mentioned earlier.

6. Project Returns: Understanding the IRR (Internal Rate of Return)

The **Internal Rate of Return (IRR)** is one of the most important metrics in evaluating how well a project will perform financially. It tells us the annual percentage return the project is expected to generate based on the money invested.

Different Types of IRR and Their Importance:

1. **Project Return (Project IRR)**:

   The **Project IRR** is the overall return the project is expected to generate on all the money put into it, including both debt and equity. It tells us how well the project will grow in value over time.

   – **Why it matters**: The Project IRR gives a high-level picture of whether the entire project is financially viable. It helps answer the question: "Is this project worth pursuing based on the total amount of money invested?"

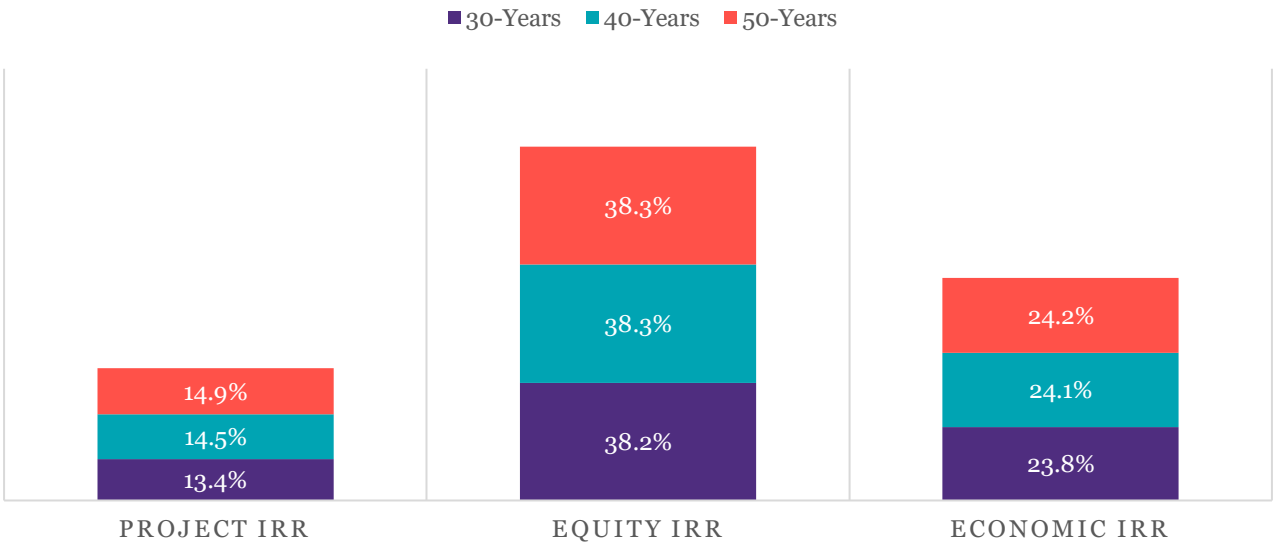
2. **Equity Return (Equity IRR)**:
   The **Equity IRR** looks specifically at the return on the money that the project owners or shareholders have invested (the equity portion). It tells equity investors how much profit they can expect to earn on their own capital, once all other costs, including debt, have been paid off.

   – **Why it matters**: Equity investors are particularly interested in this figure because it reflects the profitability of their institutional investment.

3. **Economic Return (Economic IRR)**:
   The **Economic IRR** focuses on the return the project will generate for the economy as a whole. It takes into account not just the financial benefits, but also things like job creation, savings in travel time, reduced vehicle costs, and environmental benefits.

   – **Why it matters**: Governments, policymakers, and society at large are concerned with this metric because it reflects the overall value the project brings to the economy.

Returns over Different Time Periods:



The project becomes more profitable as the time period extends. Over a 50-year horizon, the project yields higher returns, benefiting both investors and the economy.

7. Understanding NPV (Net Present Value)

The **Net Present Value (NPV)** is a critical metric for evaluating the financial performance of a project. It represents the difference between the present value of cash inflows (revenues) and the present value of cash outflows (costs).

Different Types of NPV and Their Importance:

1. **Project NPV**:
   The **Project NPV** calculates the total value the project will generate for all stakeholders, including both debt holders and equity investors. It shows whether the overall project is profitable when future revenues and costs are adjusted for the time value of money.
   - **Why it matters**: A positive Project NPV means the project is worth pursuing, as it will generate more value than it costs.
2. **Equity NPV**:
   The **Equity NPV** focuses on the value generated specifically for the equity investors. It tells us how much wealth the project is expected to generate for the shareholders after accounting for debt and other financial obligations.
   - **Why it matters**: A positive Equity NPV shows that shareholders will make a profit on their investment.
3. **Economic NPV**:
   The **Economic NPV** goes beyond financial returns and calculates the value the project creates for the overall economy. It considers broader benefits like job creation, time savings, cost savings, and environmental benefits.
   - **Why it matters**: The Economic NPV is essential for public infrastructure projects because it shows whether the project is generating more benefits for the economy than it costs.

NPV across Different Periods:

(Rs. Billion)

Period	Parameter	NPV@12%	NPV@10%	NPV@8%	NPV@6%
30 Years	Project NPV	137	426	876	1,579
	Equity NPV	485	695	1,011	1,493
	Economic NPV	1,349	2,041	3,076	4,649
40 Years	Project NPV	320	771	1,534	2,855
	Equity NPV	633	974	1,543	2,525
	Economic NPV	1,654	2,615	4,170	6,764
50 Years	Project NPV	439	1,041	2,156	4,316
	Equity NPV	729	1,190	2,042	3,695
	Economic NPV	1,819	2,988	5,027	8,771

As the time period increases, the NPV grows significantly, making the project more valuable in the long term.

8. Benefit-to-Cost Analysis: Understanding the Ratios

The **Benefit-to-Cost Ratio** (BCR) compares the benefits of a project to its costs. It tells us how much benefit is generated for every ₹1 spent on the project.

Different Types of Benefit-to-Cost Ratios and Their Importance:

1. **Financial Benefit-to-Cost Ratio**:
   This ratio looks at the **direct financial returns** generated by the project (such as revenue from rail, roads,

solar energy, etc.) compared to the costs of building and operating the project. A **Financial Benefit-to-Cost Ratio greater than 1** means that the project generates more money than it costs.

2. **Economic Benefit-to-Cost Ratio**:
   This ratio goes beyond financial returns and looks at the **broader economic benefits** of the project (such as job creation, environmental benefits, and savings in time and vehicle costs). A **higher Economic Benefit-to-Cost Ratio** shows that the project is generating significant value for the economy as a whole.

Present Value Benefit-to-Cost Ratios:

- **Financial Benefit-to-Cost Ratio**: 1.85
- **Economic Benefit-to-Cost Ratio**: 3.55

Why Present Value is Used:
Using present value accounts for inflation and shows the true value of benefits and costs today. This allows for a more accurate comparison of what the project will truly generate versus what it costs.

Financial Benefit-to-Cost Ratio: 1.85

This ratio means that for every ₹1 spent on the project, the project generates ₹1.85 in financial returns. In other words, the project makes 85% more than its total costs when considering just the financial benefits (like revenues from rail, roads, solar energy, wind energy, and other direct income sources).

- **Why it matters**:
  A Financial Benefit-to-Cost Ratio greater than 1 indicates that the project is financially profitable. It shows that the money invested in the project is generating a return that exceeds the costs. In this case, a ratio of 1.85 is a strong indicator of financial success, meaning the project produces ₹1.85 for every ₹1 invested.

Economic Benefit-to-Cost Ratio: 3.55

This ratio means that for every ₹1 spent on the project, the broader economy benefits by ₹3.55. This includes not just financial returns but also indirect benefits such as job creation, time savings (Value of Time savings from reduced travel times), vehicle cost savings (Vehicle Operating Cost savings), and environmental benefits (like carbon credits and environmental improvements).

- **Why it matters**:
  A higher Economic Benefit-to-Cost Ratio reflects the project's contribution to the wider economy and society. A ratio of 3.55 shows that for every ₹1 invested, the economy gains ₹3.55 in total value, indicating that the project has significant positive impacts on society beyond direct financial returns. This is particularly important for public infrastructure projects, where broader economic and social benefits are often a key justification for undertaking the project.

