Type of Project Appraisal: FEET

PROJECT ENGINEERING

Chapter 2 - Project Appraisal and Project Formulation

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Contents:

Concept of Project Appraisal

- Project Appraisal is **systematic and comprehensive review of** economic, environmental, financial, social, technical and other aspects of a project **to determine if it will meet its objective** i.e. overall assessment of the relevancy, feasibility and sustainability of the project likelihood for the success and its viability, **prior to making decision whether to undertake or not**.
- It is the process **of assessing and questioning proposals** before resources are committed.

Objectives of Project Appraisal

- To evaluate a projects ability to achieve its objectives
- To test whether or not resources are properly utilized or not.
- To assess the sources and magnitude of risk.
- To determine if component of projects are consistent or not.

Project Appraisal …

The project appraisal answers following questions:

- Will the project meet its objective ?
- How does the project compare with other alternatives?

What can Project Appraisal deliver

Project Appraisal helps project initiators and designers to :

- Be consistent and objective in choosing the project
- Make sure that the program benefits the all sections of community, including those from ethnic groups who have been left out in the past.
- Provides documentation to meet financial and audit requirements and to explain decisions to the local people

Technical Appraisal

- Whether pre-requisites for the success of project considered?
- Good choices with regard to location, size, process, machines etc.

Economic Appraisal

- Social cost -benefit analysis
- Direct economic benefits and costs in terms of shadow prices
- Impact of project on distribution of income in society
- Impact on level of savings and investments in society
- Impact on fulfillment of national goals :-
  (1) Self sufficiency (2) Employment and (3) Social order

Ecological Appraisal

- Impact of project on quality of :- Air, Water, Noise, Vegetation, Human life
- Major projects ,such as these, cause environmental damage
- Power plants
- Irrigation schemes
- Industries like bulk drugs, chemicals and leather processing.
- Likely damage & the cost of restoration

Financial Appraisal

- Whether the project is financially viable?
- Servicing debt
- Meeting return expectations

Project Appraisal Criteria

Technical:

- Will the project work? Has due attention been paid to technical factors affecting the project design?
- Given the human and material resources identified, can the project activities be undertaken and outputs achieved within the time available and to the required standards?

Financial:

- Can the project be financed?
- Will there be sufficient funds to cover the expenditure requirements during the life of the project?

Project Appraisal Criteria

Economic:

- Will the nation and society at large be better off as a result of the project?
- Will the project benefits be greater than the project costs over the life of the investment when account is taken of time (namely, is the Net Present Value of the project positive at the test discount rate)?

Project Appraisal Criteria

Social and gender:

- What will be the effect of the project on different groups, at individual, household and community levels?
- How will the project impact on women and men?
- How will they participate in various stages of the project cycle?
- Will the social benefits of the project be greater than the social costs over the life of the investment when account is taken of time?

Project Appraisal Criteria

Institutional:

- Are the supporting institutions in place? Can they operate effectively within the existing legislative and policy environment?
- Has the project identified opportunities for institutional strengthening and capacity building?

Environmental:

- Will the project have any adverse effects on the environment?
- Have remedial measures been included in the project design?

Project Appraisal Criteria

Political:

- Will the project be compatible with government policy, at central, regional and local levels?

Sustainability and risk:

- Will the project be exposed to any undue risks? Will the project benefits be sustainable beyond the life of the project?

Technical Appraisal

- Clearly, every project must be technically feasible.
- Technical Appraisal provides a comprehensive review of all technical aspects of the project such as rendering judgment on merits of technical proposals and operating costs.

Here is a checklist that can be used:

- Is the technology proven or tested? If not, has it ever been successful elsewhere and can that success be replicated in current context and conditions?

Technical Appraisal

Here is a checklist that can be used:

- Does the technology/ process/ equipment technically fit with the facility's existing technology/ process/ equipment & machinery? If not, what aspects of the technology / process do not fit and what measures is the implementing agency planning to take in this regard?
- List of equipments and machinery to be installed with cost and specifications of the equipment.
- Equipment capacity & whether it is as per requirement?
- List of recommended equipment suppliers.

Social Appraisal

- A social appraisal reviews the project design and the process of project identification through the implementation and monitoring, from **a social perspective**.
- Particular attention is paid to the likely impact of the project on different stakeholders, their opportunities for participation, and the project's contribution to poverty reduction

Social Appraisal

Stakeholders participation and their analysis

- Based on the distinction of primary, secondary and key stakeholders, stakeholder analysis reviews the following:

✓ Who comprise the different stakeholders?
✓ What are their interests?
✓ How will they be affected by the proposed project?
✓ What are the project priorities between the different groups?
✓ What is their capacity to participate in the project?

Social Appraisal

- Stakeholders have different abilities to influence the outcome of a project.
- Often target beneficiaries are in a relatively weak position to influence the outcome of a project whereas much of the control lies in the hands of secondary and key stakeholders.
- The former may be frustrated by a lack of access to information or be placed in a weak social position due to traditional hierarchies.
- In contrast the latter may have the time, money, organizational capacity or political power necessary influence the project; however, if they are not interested in the project, they could pose a risk to the project's success by withholding support.

Social Appraisal

Poverty focus

- Many projects are required to specifically address issues of poverty. In order to ensure the project incorporates a poverty dimension, it is necessary to determine:

❑ Who are the poor (at community, household and individual level)?
❑ What are the characteristics of their poverty (in terms of access to and control of resources and benefits, vulnerability and exclusion)?
❑ How may issues of poverty be addressed in the project?

Economic and Financial Appraisal

- This includes an analysis of economic soundness of the project and the quantification and valuation of costs and benefits to ensure financial viability

Economic and Financial Appraisal

Social Cost Benefit Analysis

- Cost Benefit Analysis (CBA) is used for determining the attractiveness of a proposed investment in terms of the welfare of society as a whole. By presenting social benefits and costs in a monetary format, CBA not only facilitates choices between alternative investment options but also gives an idea of the project worth. The technique is principally used with regard to public sector investments.
- CBA differs from financial appraisal which views an investment solely from the perspective of individual participants, focusing on private benefits and costs and using market prices. In contrast, CBA adopts a much broader approach, considering both monetary and non-monetary benefits and costs, and uses prices that more accurately reflect economic, environmental and social values.

Economic and Financial Appraisal

- **Internal Rate of Return**
- The IRR of a project is defined as that rate of discounting the future that equates the initial cost and the sum of the future discounted net benefits. It is the discounted rate that makes the NPV of a project equal to zero OR its BCR = one.
- The decision criterion: A project with an IRR exceeding some predetermined level (Social discount rate) is deemed acceptable.
- The internal rate of return is a very popular method of project appraisal and it has much to commend it. In particular it takes into account the time value of money. Basically, what the IRR tells you is the rate of return you will receive by putting your money into a project. It describes by how much the cash inflows exceed the cash outflows on an annualised percentage basis, taking account of the timing of those cash flows.
- IRR is also referred to as the 'yield' of a project.

ENVIRONMENTAL APPRAISAL

Environmental Assessment (EA)

- Environmental Assessment (EA) is supposed to provide the project analyst with a good quantification of the biophysical and social impacts from developments. Environmental Assessment generally refers to the broader system of environmental analysis, including project-specific Environmental Impact Assessment (EIA).
- Most countries have an EIA policy and supporting legislation. Traditionally, EIA was designed to operate at the project level; that is to identify impacts and mitigation measures for an individual project. In the past several years however, the EIA process has gradually been extended to sectoral levels, strategic reviews of policy, and even at a global level. This section will briefly discuss focus on project EIA.

Project Proposal

- A proposal is basic document containing the explanation of all activities to be performed while understanding an investment venture.
- Due to the uniqueness of the project every proposal are different.
- However, its objectives are to:
  - Identify what works to be done
  - Explain why this works needs to be done
  - Persuade the readers that the proposer are qualified for the work, have a plausible management plan and technical approach and have the resources needed to complete the tasks within the stated time and cost co

Project Proposal

Contents

- A strong proposal has attractive, professional, inviting appearance. In addition, the information should easy to access. It has well organized plan of affect and technical details.
- The proposal should have following section and heading :
  - Title page
  - Title of project in initial capital letters
  - The sponsoring company and contact person's name and information
  - Team name and individual members name

- Date
- An appropriate picture of the product or team logo or both
- Executive summary
- A brief summary of the proposal.
- Table of the contents
- **Statement of the problem; why?**
- Background information to educate the readers
- Previous related work by others

- **Literature review**
- Details problems description
- **Objectives ; what**
  - In objectives section you translates the customers' quantitative and qualitative needs into clear objectives
- **Technical approach :how?**
  - Although you may not know all the details solution ,you should know how you will attack the problems and you should have some designs concepts. The purpose of this section is to present the process by which you will arrive at the final answer.

Deliverables

- In section provide a detailed description of what you are providing and when you will provide it. Be as specific as possible. Possible item include
- Detail design drawings
- Engineering analysis
- Data from experiments, etc
- Budget; ”how much”;
- Provide your best estimate of how much funds will be required and how they will be spent.

Financial part of the project proposal

- It describes the financial parts of the projects and covers
- Statements of work
- Costs of basic materials
- Supporting Schedule
- Cost Break down and work break down structure
- Cost estimates techniques
- cost summary
- Profit statement

BE/ ME thesis report

1. Introduction
   - 1.1 Background
   - 1.2 Objectives
   - 1.3 Statement of Problem
   - 1.4 Scope/ Limitations
2. Literature review
3. Methodology
   - 3.1 Study Area
   - 3.2 Data Collection and Analysis
4. Result and Discussion
5. Conclusions
6. References
7. Appendices

Procedure for developing Project Proposal

1. Proposal Brief
2. Pre/feasibility study
3. Preliminary Detail design
4. Proposal Development

Project Brief

- The client develops the project idea and prepares the statement of work which describes the need and requirements. The content includes:
  - Need of project
  - Scope of project
  - Objectives and output of project
  - Specification and acceptance criteria
  - Estimated budget for the project
  - Estimated time tables
- The project brief serves as a starting point of the development of project proposal. It indicates the need and requirements of the customer

Pre/Feasibility Study

- This study is performed to check the implement ability of the project. If detail feasibility study is required, then feasibility study is done before it.
- The area for which information is collected and analyzed is:
  - Technical
  - Economical
  - Financial
  - Market
  - Management
  - Environment

Preliminary/Detail Design

- It is the elaboration of project idea and is based on the requirement of pre/feasibility study.
- It prepares the conceptual design and architectural drawing for implementation. It includes:
  - Technical aspects consisting of preliminary surveys and engineering design
  - Preliminary project schedule and implementation
  - Estimated project cost

Proposal Development

- After collecting the all required information , the final step is developing the project proposal. It should contain following information:
  - Problem Statement
  - Objectives and outputs
  - Activities
  - Project Implementation
  - Project Schedule
  - Project budget
  - Project monitoring and Evaluation

Project Formulation

- Project formulation is the systematic development of a project idea for arriving at an investment decision.
- It has the built-in mechanism of ringing the danger bell at the earliest possible stage of resource utilization.
- Project formulation is the process of examining technical, economic, financial & commercial aspects of a project.
- It refers to a preliminary project analysis covering all aspects such as technical, financial, commercial, economic & managerial to find out whether it is worthwhile to take project for detailed investigation & evaluation.

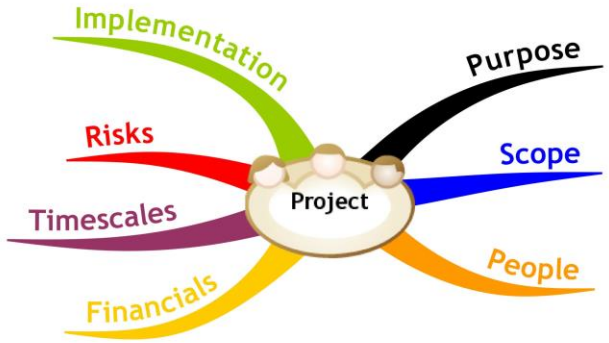
Techniques of Project Formulation

- Project Formulation is a concise , exact statement of a project to set the boundaries or limits of work to be performed by the project.
- It is formal document that gives a distinctive identity of the project and precise meaning to the project work to prevent conflict, confusion, overlap. Project formulation aims to:
  - Carefully identify and weight various components of project work
  - Analyse project feasibility and cost effectiveness
  - Identify the stakeholders and their involvement and contribution
  - Define benefits and expectations

Techniques of Project Formulation

- Estimate resources needed
- Perform a preliminary analysis of risks
- Make outline of project schedule
- The techniques of project formulation are
- Feasibility analysis
- Cost Benefit analysis
- Input Analysis
- Environment analysis

Techniques of Project Formulation



Feasibility Analysis

- It is used to determine the viability of the idea
- The objective of such analysis is to ensure a project is legally and technically feasible and economically justifiable
- It evaluates the projects' potential for success
- Areas of project Feasibility:
  1. Technical Feasibility
  2. Economic Feasibility
  3. Financial Feasibility
  4. Market Feasibility
  5. Managerial Feasibility
  6. Legal Feasibility

1. Technical Feasibility

- Centered to the technical resources available to the project.
- Whether technical resources and team is capable of converting the ideas in to working systems.

2. Economic Feasibility

- Assesses the viability, cost associated with the projects before financial resources are allocated.
- Helps decision makers determine the positive economic benefits to the organization that the propose system will provide and help to quantify them

3.Financial feasibility

- Whether the project is viable after the considerations its total cost and probable revenues.
- If the revenue covers the cost of the project then project is viable

4. Market Feasibility

- Study and analyze the economic, demographic and competitive factors that impact the development project.
- Determines what type of project would be appropriate for specific location.

5. Managerial Feasibility

- Studies the rationally uncover the strengths and weakness of an existing business , opportunities threats which are preset in the environment.
- Management support, employee involvement and commitment are the key element required to gauge managerial feasibility

6. Legal Feasibility

- Investigates if proposed system conflicts with legal requirements

Cost Benefit Analysis (CBA)

- It estimates and totals up the equivalent money value of the benefits and cost to the project to establish whether they are worthwhile
- **It evaluates the project from social point of view, also known as Social cost benefit analysis**
- Comprises not only financial effects but also social effects like pollution, safety, market

Advantages

- The ability to identify the project that maximize the welfare of the country
- The ability to objectively assess and quantify the purpose projects in relation to community needs
- Exposure of the basis for decision making for projects and opportunity for public criticism
- Ability to rank and prioritize limited resources so that maximum benefit is realized

Disadvantages

- Difficulty in measuring social cost and benefits and converting them into monitory form
- Complexity
- Conflict between social welfare and financial justification.

Input Analysis

- Project requires various input. It includes 5 M
  - Manpower
  - Materials
  - Money
  - Minute
  - Machines

Environment Analysis

- It is the process of estimating and evaluating significant short term and long term effects of project on quality of locations environment.
- Identifies ways to minimize , mitigate and eliminate these effects and/or compensate these impact
- It includes:

Environment suitability

- It is necessary to check whether the project is suitable for existing environment or not

Environment Impact

- It is also necessary to identify the possible adverse effects caused by the development, industrial, or infrastructural project or release of substance in the environment
- It can be down in two ways :

➢ **Initial Environment Examination**

- First review of reasonably foreseeable effects
- Describes the environment condition of project

➢ **Environment Impact Assessment**

- Process of assessing the likely environment impacts and identifying options to minimize the environmental damage
- Carried out for large projects

Assignment 1 (ii)

Make a complete note on following topics :

2.1 Concept of Project Appraisal
2.2 Project Proposal (technical and financial)
2.3 Procedure for Developing Project Proposal
2.4 Techniques of Project Formulation

- Feasibility analysis
- Cost Benefit analysis
- Input analysis
- Environmental analysis