

School of Civil and Environmental
Engineering

Engineering Economics (CEng 5211)

Chapter 6

Overview of Project Feasibility Study

6.1 Introduction

- Managers usually face the challenging decision of choosing between large numbers of development projects.
- At the very first stage of undertaking an investment option an organization needs to consider

Whether some idea **will work or not?**

Definition

- “**Feasibility study** is simply defined as precise reviews and examinations to decide the feasibility of different investment alternatives.”
- “A feasibility study is an analysis of the viability of an idea through a disciplined and documented process of thinking through the idea from its logical beginning to its logical end.”
- Feasibility study is carried out in order to assess the viability of a new project.
- It is primary and most important thing in development of a project.

6.1 Introduction

→ **Why do we need to carryout FS?**

- **Reasons for undertaking the study:**

- Gives focus to the project.
- Narrows the business alternatives.
- Identifies new opportunities.
- Identifies reasons not to proceed.
- Provides valuable information for “go/no go” decision.
- Increases probability of business success by identifying weaknesses early.
- Provides documentation that the idea was thoroughly investigated.

6.1 Introduction

- Investments by the public sector are relatively inefficient and result in wastefulness of resources.
- There are many classifications for feasibility studies.
- They can be mainly classified according to the **type of profit and the function of the study.**
- **According to the Type of Profit**
 - Private sector
 - Public sector
- **According to the Function**
 - Legal feasibility study
 - Marketing feasibility study
 - Technical and engineering feasibility study
 - Financial and economic feasibility study
 - Social feasibility study

6.1 Introduction

→ According to the **Type of Profit**

▪ **Private sector**

- This is known as the **private profitability** of the investment project.
- It expresses **self-benefits** of the project, regardless of any side effect of those benefits on other projects or on the national economy of the country.
- The main aim of private profitability-feasibility studies is to maximize self-benefits of the project to its investors or founders.

▪ **Public sector**

- This is known as the **social profitability** of the investment project.
- It expresses self-benefits of the project and any side effect of this project on other projects or the national economy of the country.
- The main aim of social profitability-feasibility studies is to maximize self-benefits of the project to the society as a whole (Table I).

6.1 Introduction

→ According to the **Type of Profit**

- **Private sector**
- **Public sector**

Table I

Type	Cost	Benefit	Purpose
Private Feasibility Study	Include costs of the project assets.	Expresses the self-benefits of the project	Maximize the self benefits of the project to its investors or founders.
Public Feasibility Study	Include costs of the project assets and externalities costs	Expresses the self-benefits of the project, the externalities benefits and any side effect of this project on other projects or the national economy of the country	Maximize the self benefits of the project to the society as a whole.

6.1 Introduction

→ **According to the Function:** classified according to the function of each portion of studies as follows;

- **Legal feasibility study:**

- Is the study to know if the proposed project conform the **legal and ethical requirements**.
- Is the project legally feasible? Are all legal requirements attained?
- This is done when the legal aspects are given a central importance in taking the investment decision.
- It should include at least three important steps.
 - Analysis of the applicable legal framework.
 - Assessment of the legal readiness of the procuring authority.
 - In-depth legal analysis of the main project issues: Large infrastructure projects often have particularities with significant legal implications.

6.1 Introduction

- **Marketing feasibility study**

- Whenever applicable, marketing studies are done for different projects. Most market feasibility studies include:-

- Description of the industry;
- Current Market Analysis;
- Competition or presence of competing products;
- Anticipated future market potential;
- Potential buyers and sources of revenues, and
- Sales projections.

6.1 Introduction

- **Technical and engineering feasibility study**
- A technical feasibility study assesses the details of **how you intend to deliver a product or service to customers.**
- Think **materials, labor, transportation**, where your business will be **located, and the technology** that will be necessary to bring all this together.
- It's the logistical or tactical plan of how your business will produce, store, deliver, and track its products or services.

6.1 Introduction

- **Financial and economic feasibility study**
 - This study is always carried after the previous studies, for all types of projects.
 - It converts the results of marketing, technical and engineering studies into financial and economical value. This includes cost, required funds, and expected benefits.
- **Social feasibility study**
 - This study is carried to review the feasibility of investment from the social point of view.
 - It measures the social profitability of the investment project.
 - There is no formal arrangement for the previous studies. Usually they are carried out in parallel. Sometimes, there is no need to carry out a legal study or marketing study for some types of projects.

6.1 Introduction

→ According to the **Function**:

Function	Central Consideration	Study Purpose
Legal feasibility study	Legal aspects	The legality of the project.
Market feasibility study	Market studies	The project marketing.
Technical & engineering feasibility study	Technical studies	Study the technical aspects of the project.
Financial & economic feasibility study	Funds and economical studies	Convert the above studies to costs, required funds, and expected benefits.
Social feasibility study	Social benefits	Measures the social profitability of the project.

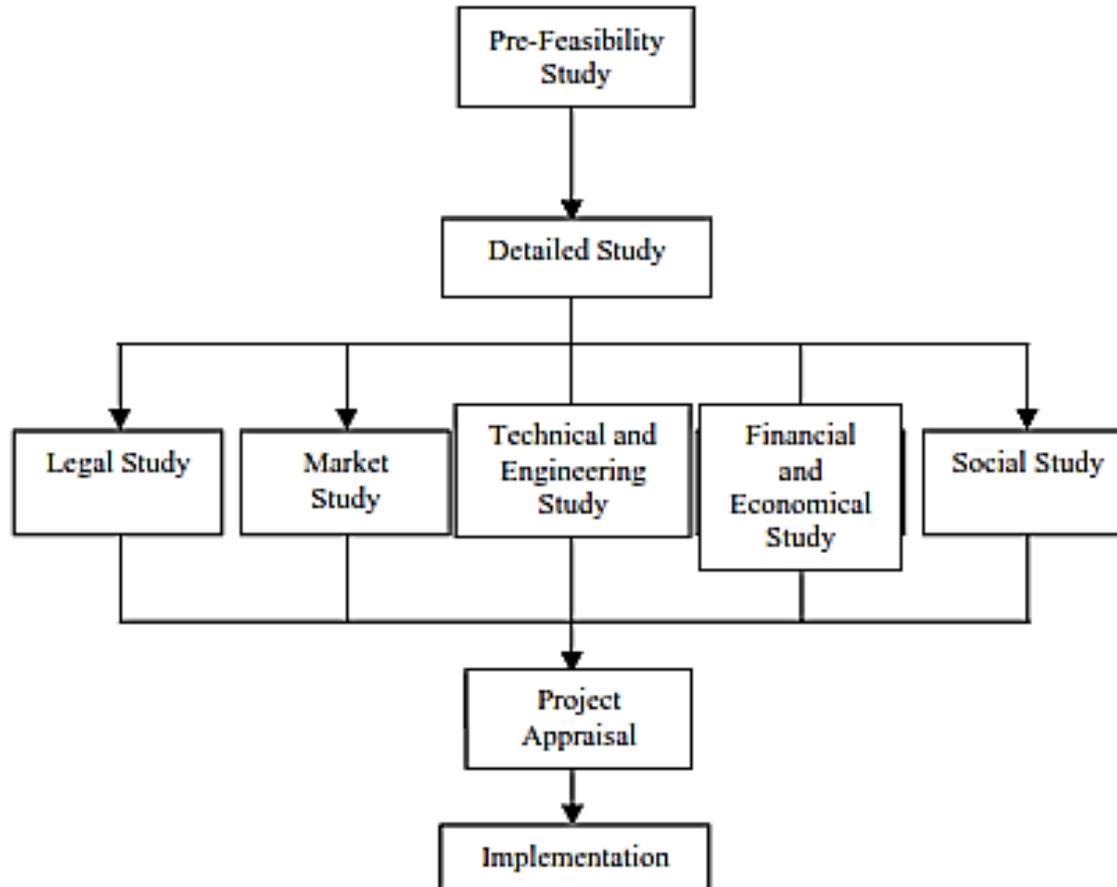
6.2 Overview of Feasibility Study Procedures

- There are **no specific approaches to carry out feasibility studies** for all types of projects. However, there are consensus procedures to carry out feasibility studies phases.
- The **traditional feasibility study** is the most famous procedures used mainly for private projects and many of the public projects.
- Other **international procedures** as the World Bank procedure is widely used for public projects that use international fund or aid.
- Other donors and fund organizations do not require determined feasibility study procedures.

6.2 Overview of Feasibility Study Procedures

▪ Traditional Feasibility Study

- The traditional feasibility study implies the collection and arrangement of data of different project alternatives to extract information and measurements to appraise each alternative in order to support decision-making.
- Usually, it is divided into the following steps:



6.2 Overview of Feasibility Study Procedures

Traditional Feasibility Study

1. Pre-feasibility study (Concept and inception phase):

- implies the discussion of the investment idea.
- It may include a representation of the investment idea with a simple criterion that lead to a **primary approval or refusal of the idea** (legal, marketing, technical and engineering, financial and economical, or social).

2. Detailed feasibility study (Design and development phase):

- includes more detailed studies of the investment idea with a detailed legal, marketing, technical and engineering, financial and economical, or social criterion that lead to project appraisal.
- The tasks associated with such studies include the following studies:
 - Legal Study
 - Market Study
 - Technical and engineering study
 - Financial and economical study
 - Social study

6.2 Overview of Feasibility Study Procedures

Traditional Feasibility Study

- **Detailed feasibility study (Design and development phase):**
 - **Legal study:** includes the legal aspects of the project, any legal issues forbidding the project and any legal modifications required to proceed in this project.
 - **Market study:** includes the supply, the demand, the supply and demand analysis, and the project market share.
 - **Technical and engineering studies:** define the project capacity, type, complete design, construction process and method, site location, and planning schedules.
 - **Financial and economical studies:** define the investment costs which include the fixed costs (land, building, equipment etc.), financial schedule, resources and budgets, and revenues or benefits.
 - **Social study:** measures the social profitability of the project.

6.2 Overview of Feasibility Study Procedures

Traditional Feasibility Study

- **Project Appraisal:**

- The expected economic and social revenues of the project are evaluated and analyzed using a variety of techniques to decide the project feasibility.
- Traditionally, investment decisions on public projects are made by the investing government based on the cost-benefit analysis and economic viability of the projects.
- The most common methods for the assessment of financial viability are the payback period, rate of return, net present value (NPV), and internal rate of return (IRR) methods.
- Decisions derived from these methods are based on the forecasts of base-case cash flows.
- However, public projects are characterized by high capital outlays, long lead times, and long operating periods, which lead to inadequate cash flows forecasting.

6.2 Overview of Feasibility Study Procedures

→ Feasibility Study according to World Bank Procedure

- World Bank (WB) provides funds to governments and public organizations guaranteed by their governments to execute **public projects**.
- Projects range across the **economic** and **social** spectrum in these countries, e.g., infrastructure, education, and health projects.
- The projects' bank finances are conceived and supervised according to a **well-documented project cycle** that constitutes the *feasibility study* of the project from the bank point of view.
- The feasibility study steps followed by the WB are shown in figure below.



6.2 Overview of Feasibility Study Procedures

→ Feasibility Study according to World Bank Procedure

- **Country Assistance Strategy:** Under its current development policy, the bank helps governments take the lead in preparing and implementing development strategies in the belief that programs that are owned by the country, with widespread stakeholder support, have a greater chance of success.
- The bank prepares **lending and advisory services**, based on the selectivity framework and areas of comparative advantage, targeted to country poverty reduction efforts.
- **Identification:** Projects that can be funded as part of the agreed development are identified. The bank prepare an outline of the basic elements of the project, its proposed objective, likely risks, alternative scenarios to conducting the project, and a likely timetable for the project approval process.

6.2 Overview of Feasibility Study Procedures

→ Feasibility Study according to World Bank Procedure

- **Preparation:** This part of the process is driven by the country that the Bank is working with and can take from a few months to three years, depending on the complexity of the project being proposed.
- The Bank provides policy analysis and project advice along with financial assistance where requested.
- During this period, the technical, institutional, economic, environmental, and financial issues facing the project are studied and addressed.
- **Appraisal:** The bank assesses the economic, technical, institutional, financial, environmental, and social aspects of the project. The project appraisal document and draft legal documents are prepared.
- **Negotiations and Broad Approval:** The bank and the country that is seeking to borrow the funds negotiate on **loan or credit** agreement. Both sides come to an agreement on the terms and conditions of the loan.

6.2 Overview of Feasibility Study Procedures

→ Feasibility Study according to World Bank Procedure

- **Implementation and Supervision:** The borrower implements the project. The bank ensures that the loan proceeds are used for the loan purposes with due regard for economy, efficiency, and effectiveness.
- **Implementation and Completion report:** The implementation and completion report is prepared to evaluate the performance of both the bank and the borrower.
- **Evaluation:** The bank prepares an independent audit report and evaluates the project. Analysis is used for future project design.

6.2 Overview of Feasibility Study Procedures

→ Example

- **Back ground information**

- The Owner
- Objective of the company
- Brief Information on the Owners

- **Technical assessment**

- Location of the Project
- Project Layout
- Material Supplies

- **Market & demand aspects**

- Presumptions
- Price Determination
- Production Capacity
- Utilities
- Manufacturing Process

- **Organization, management and manpower**

- Organization and Management
- Manpower

- **Financial aspects**

- Fixed capital
 - Land & building
 - Machinery & equipment
 - Total fixed capital
- Working Capital
 - Salary & wages
 - Raw materials
 - Utilities
 - Miscellaneous expenses

TOTAL CAPITAL INVESTMENT

= Total fixed capital + Working capital for three months

6.2 Overview of Feasibility Study Procedures

- → **Example**

- **Financial analysis**

- Cost of production
- Sales turnover
- Net profit
- Profit ratio on sales
- Rate of return
- Economic Evaluation: NPV, PBP, IRR...

Thank You