

UNIT – 2

Technical Analysis:-

Technical analysis of a project is concerned primarily with:

1. Material Inputs and Utilities
2. Manufacturing Process/Technology
3. Product Mix
4. Plant Capacity
5. Location and Site Development
6. Machineries and equipment
7. Structures and Civil works
8. Projects Charts and Layouts

Technical Analysis of a Project

1) Material input & utilities – It involves defining the requirements for materials and utilities, specifying their properties and setting up a supply channel. Material input & utilities may be classified into the following:

Raw materials – Agricultural products, Mineral Products, Livestock, Forest Products, Marine Products
Processed Industrial Materials/Components – Base metals, semi-processed materials, manufactured parts, small component.

Auxiliary materials and factory supplies – chemicals, additives, packaging material, paint, oil, grease, cleaning materials

Utilities – power, water, steam, fuel

The following must be kept in mind while taking decisions regarding material, inputs and utilities:

1. Physical properties of the material
2. Transportation, Handling and Storage costs
3. Quantity available from Domestic/Foreign sources

4. Past and future trends in prices

(2) Manufacturing process/Technology – Taking a decision on manufacturing process and technology to be used is one of the most important decisions in technical analysis of a project. There are various options and alternatives available for manufacturing a product or service. It is the task of the project manager to select that process or technology that is easy to acquire, appropriate for the project and feasible with budget and technical requirements of the proposed project.

The choice of technology is influenced by the following considerations:

- Plant Capacity
- Material Inputs
- Production cost
- Product mix
- Technological Obsolescence
- Ease of adoption

(3) Product Mix – An important aspect in technical analysis of a project is product mix decision. It is essential to choose an effective product mix as different customers have different taste, preferences and needs. The choice of product mix is usually guided by market requirements. A project manager must keep in mind the quality of products and flexibility in production while taking product mix decisions.

(4) Plant capacity – It refers to the volume or no. of units that can be manufactured during given time period. It is also known as production capacity. It is the task of the project manager to determine the feasible normal capacity and nominal maximum capacity for the project.

Feasible Normal Capacity – It refers to the capacity attainable under normal working condition. It is computed keeping in mind the following factors:

- Installed capacity (machinery and equipment)
- Technical conditions of the plan
- Normal stoppages
- Holidays, shift patterns
- Downtime for maintenance etc.

The feasible normal capacity is the actual production capacity of a plant and usually depends upon the following factors:

- Technical Requirements
- Input Constraints
- Cost of Investment
- Market Conditions
- Resources of the company
- Government policy

Nominal Maximum Capacity – It refers to capacity that is technically obtainable through use of machines. It is usually the capacity guaranteed by the supplier of machinery.

(5) Location & Site – Location refers to a broad area within the city and while site means a specific piece of land where project would be set-up. For the purpose of site selection a critical assessment of the demand, size of plant and input requirements is conducted which involves examining the following factors:

- Proximity of Land to Markets
- Availability of raw materials
- Availability of Labour
- Existing Infrastructure i.e. roads, electricity, power, water supply
- Cost of land
- Government Policies

Miscellaneous other factors like

- Climatic conditions
- General living conditions
- Proximity to auxiliary inputs / units
- Ease of Waste disposal and dumping

(6) Machinery & Equipment – Machinery and Equipment requirement depends upon the production technology and plant capacity of the proposed project. While conducting a technical analysis of a project the following steps must be used to select machinery and equipment:

Steps to select machinery and equipment for a project-

- Estimate levels of production over time
- Define various machining and operations
- Calculate machine hours required for each type of operations
- Select equipment and machinery for each function

Types of Machinery and equipment –

1. Plant equipment (process)
2. Mechanical equipment
3. Electrical equipment
4. Instruments
5. Controls and Internal Transportation System
6. Spare parts and Tools – required with the original equipment and for operational wear and tear.

Things to be considered while selecting machinery and equipment:

- Availability of power to run machines
- Transporting heavy equipment
- Ease of use
- Import Policies of Government if the machines are to be imported from a foreign country
- Machinery may be procured in two ways either by placing different orders to different suppliers or through a turn-key contract

Factors affecting procurement of Machinery→

1. Quality of machinery
2. Level of technical sophistication
3. Reputation of supplier
4. Expected delivery schedule
5. Payment terms
6. Performance guarantees

(7) Structure and Civil Works – Technical analysis of a project for buildings, structures and civil works involves preparation and development of site which includes:

- grading and leveling of land

- demolition of existing structures
- relocation of pipeline, cables, roads
- reclamation of sewers and drainage
- connections for utilities
- arranging for electricity, water etc.

Buildings & structures – It involves construction of

- factory buildings
- ancillary buildings
- administrative area
- residential quarters
- non factory buildings – cafe, medical center

Outdoor works – It involves

- supply & distribution of utilities
- handling and treatment of emission, wastes, effluents
- outdoor lighting
- transportation
- landscaping
- enclosure and supervision – boundary, fence, barriers, gates, doors, security posts

Environment Aspect –

The project must comply with all environmental rules and regulations

All affluent must be disposed-off properly

Eco-friendly standards must be adopted in the production process

(8) Projects Charts & Layout – Once the project manager has sufficient data related to market size, plant capacity, production technology, machinery and equipment, buildings etc. he prepares charts and layouts for the proposed project. Project charts and layouts help to:

- Define the scope of the project
- Provide basis for detailed project engineering
- Help is estimating investment and production cost

Types of Layout:

- General Function Layout
- Materials Flow Diagram
- Production Line Diagram
- Transport Layout
- Utility consumption layout
- Organizational Layout

Plant Layout – It is concerned with the physical layout of the factory. Plant layout is depends upon the production process adopted for the project, it involves the following considerations:

Consistency of layout with production process and technology, Smooth flow of goods from 1 stage to another, Proper utilization of space, Scope for further expansion, Minimization of production cost, Safety of personnel

After conducting a technical analysis, a project implementation schedule is prepared which reflects the plan of action regarding installation of machinery and operation of plant.