CHAPTER - IV
PROJECT APPRAISAL TECHNIQUES
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4.1. INTRODUCTION:

It is essential that every project is technically sound, financially feasible, economically beneficial, commercially dependable and organisationally adequate. This requires elaborate tools and criteria for appraising and evaluating the technical, financial, economic, commercial and organisational worthiness of projects. Goel gives a list of 28 questions of various types which can help in the process of appraisal.

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Basic Questions</th>
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<tbody>
<tr>
<td>Technical</td>
<td>1. Is the project sound from technical point of view?</td>
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<td></td>
<td>2. Whether technology to be used including types of equipment or processes is going to be obsolete in near future?</td>
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<td>3. To what extent, project is dependent on foreign technical know-how?</td>
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<td>4. Is the project sound from engineering point of view?</td>
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<td>5. Whether project design depicts a detailed description of all the activities and whether the project is likely to be commissioned as per schedules?</td>
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<tr>
<td>Economic</td>
<td>1. Does the project fit in the national planning framework?</td>
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<td>2. Is the project in sector of high priority?</td>
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<td>3. Is the project likely to contribute effectively to the development of that sector?</td>
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<td>4. Will that contribution justify the investment of scarce resources in project?</td>
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<tr>
<td>Financial</td>
<td>1. Is the enterprise to construct and operate the project financially sound? If not, how can it be made so?</td>
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<td>2. Whether project cost estimates have been determined on basis of prices that may prevail in expected year of commissioning?</td>
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<td></td>
<td>3. What financing will be needed to bring the facility into operation and from what sources?</td>
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<td></td>
<td>4. Whether the investor has the ability to repay loans to the lending institutions within the stipulated time?</td>
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</tbody>
</table>
5 What will be the probable operating costs and revenues perspective liquiditv and rate of return ?

4 Commercial
1 Have arrangements been made for sustained supply of goods and services needed for construction ?
2 Have adequate arrangements been made for uninterrupted supply of inputs needed in the operation ?
3 Have adequate arrangements been made to determine the market demands as well as marketing channels for the supply of end products ?

5 Organisational
1 Is the organisation proposed to carry out and to operate the project likely to be successful ?
2 Would outside help be needed ?

6 Managerial
1 What is the quality of the proposed management ? Is it likely to be adequate to ensure performance not inferior to that to be expected from the appraisal ?
2 Whether existing procedures are adequate to control and direct the project ?

7 Social
1 What are the changes caused by the project in the behavioural pattern and the attitude in the structure of the population ?
2 What are the attitudes of the population towards the projects ?
3 Does the project require specific element of social change ?
4 In what way the beneficiaries are likely to be involved or participate in the various phases of the project ?

8 Environmental
1 Does the project cause pollution ?
2 Does the project disturb the equilibrium of ecology ?
3 Does the project fit into the environment ?


Project appraisal involves comparison of costs and benefits for the rational allocation of given resources among various alternatives. As a matter of fact, choosing an alternative investment opportunity is not only customary but also virtuous for both investors and customers as choosing implies an effective and persistent comparison of pros and cons peculiar to various programmes. There is no standard cook-book formula.
that fits all situations while appraising a project. The process of appraisal undergoes some series of steps, viz., classification, tabulation, presentation, and is followed by analysis of the available lucrative opportunities.

4.2. IMPORTANCE OF APPRAISAL:

The appraisal of a small project may need much lesser information as compared to big projects. Sometimes a particular information may not be readily available. In such cases, personal judgement is applied to determine the most suitable alternatives. Techniques or check-lists are used as an aid with discretion, rather than as routine tools.

The appraisal of a project is equally important for a lending institution. It (bank or a financial institution) has to examine the viability of each project before it provides financial assistance. It has to ensure that the project will generate sufficient returns on the resources invested in it. With the shift from security oriented lending to purpose oriented lending, the study of viability of a project has become more vital while financing a project.

The viability of a project depends on technical feasibility, marketability of the products at a profitable price, availability of financial resources in time and proper management of the unit. It should be within the framework of national priorities based on social cost-benefit analysis.

4.3. OBJECTIVES OF PROJECT APPRAISAL:

The fundamental objectives of appraising a project are:

- to determine future expected contributions of project alternatives,
- to determine various cost and benefits of those proposed actions,
In order to meet the above objectives, a project appraiser should seek an appropriate appraisal methodology. The methodology should be able to:

- Provide an integrated framework towards all types of goals (economic, political, social, commercial, etc.),
- Provide an organic link between goals pursued and alternatives considered,
- Explicitly state values implied by goals and assumptions made,
- Define the means of verification of theory and assumptions made,
- Set a general and adaptable framework that is tailored to various characteristics of project actions,
- Focus on information that helps in determining sensitivities of the project outcome to proposed assumptions,
- Disseminate information to identify key variables that need close monitoring during project execution,
- Provide necessary flexibility in the project design to adapt the projects to unforeseen developments or to new insights in the developmental process,
- Apply the information on the development of a project at micro level,
- Focus on the significance and effectiveness of policies by providing necessary information to ex-post evaluation on the effects of a project,
- Install an information system that provides a detailed project experience and gives a feedback so that future projects can be fine-tuned.
4.4. SELECTION OF METHODOLOGY FOR PROJECT APPRAISAL:

The following chart (Figure 4.1) throws light on various project appraisal methodologies that are universally practised.

Fig. 4.1. Appraisal Methods: Classified

The traditional tools of project appraisal focus purely on quantifiable logic of cost-benefit analysis or cost-effective analysis to identify the true worthiness of a project. The modern tools of appraisal pay sufficient attention on the new dimensions of quality of life as well as standard of living in terms of concentrating on issues like 'environmental pollution' and 'social-cost benefit analysis'. Therefore, a comprehensive appraisal of a project can be performed by covering all these perspectives.
- financial appraisal,
- technological appraisal;
- economic appraisal,
- managerial appraisal

Figure 4.2 helps to provide an overview of the total project appraisal

Fig. 4.2. Project Appraisal: Integral of Cost and Benefits
4.4.1. TECHNICAL APPRAISAL:

Technical appraisal is made to ascertain whether necessary physical facilities required for production are available or not and to select the best possible alternative to procure the facilities. Therefore, it will include the study of manufacturing process, technical arrangements, size of the plant, product mix, selection and procurement of plant and machinery, plant layout, schedule of project implementation and location of the project.

In the process of attaining above objectives the appraiser may confront with various classes of technology. The technology for the projects can be classified on the basis of:

- Purpose for which it is applied
- Level at which it is used
- Nature of skills applied while using the technology

The Figures 4.3 and 4.4 exhibit the classification of technology according to purpose and levels.

**Technology Pool**

![Diagram of Technology Pool]

**Fig. 4.3. Purpose Based Classification**
Manufacturing Plant:

Fig. 4.3: Level based Classification

4.4.1.1. Basic points of Technical Appraisal:

a. **Determination of Technical Process/Technology:**

If a product can be manufactured by using alternative raw materials with alternate process routes, a comparative study should be done to choose the most suitable process. The selection of process depends on quantity of production required, quality of the product required, its end use, availability of particular raw material and cost of process.

Technological developments and upgradation has helped in better utilisation of resources and reduction in manufacturing cost in the fields of electronic based consumer durables, computers, colour prints, etc. If a new process is developed which is more economical, it should be preferred for setting up new units provided it is suitable to our country. A process from foreign country should not be adopted blindly without giving due consideration to local conditions. It is necessary to study the back-up arrangements.
such as technical collaboration agreement and/or the results of the units using a particular technology.

If a product is to be manufactured by a particular process for the first time in the country, necessary study should be done about the success of that process in other countries and it should be ensured that arrangements for using the proposed technology are satisfactory. Similarly, necessary study should be done to ensure that a process developed in a research laboratory will be successful on a commercial scale. With the object of assisting entrepreneurs in identifying and selecting most appropriate technology, the Government of India has set up a Technology Data Bank during 8th Five Year Plan. The Data Bank keeps necessary information on internationally available commercial technology so that the entrepreneurs are able to choose most appropriate technology for their proposed products. In order to promote adoption of new processes and technological innovations, IDBI has set up a Venture Capital Fund to provide assistance at concessional rate of interest during the development period. The rate of interest is enhanced once the process is developed and the product is accepted in the market. Similarly, IFCI has promoted the Risk Capital and Technology Finance Corporation to provide venture capital for promoting projects relating to adoption of technological innovations. A few other institutions have also framed special schemes to provide assistance for setting up industries using new technology where risk is high in the initial stage but return may be high when the product is accepted in the market.
4.4.1.2. Procurement of Technical know-how

Satisfactory arrangements have to be made to obtain necessary technical know-how required for the proposed manufacturing process. The technical know-how can be procured from the following sources:

i. Foreign Collaborators
ii. Consultancy Organisations
iii. Machinery Suppliers
iv. Promoter’s knowledge and experience
v. Recruitment of suitable technical personnel

4.1.3. Deciding Plant size:

Size of the plant or its capacity can be expressed in one of the following terms:

<table>
<thead>
<tr>
<th></th>
<th>With respect to output (Quantity of finished product)</th>
<th>Pulp and Paper, Cement, Mini-steel plant, etc</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>With respect to input (Quantity of main raw material used)</td>
<td>Sugar mill, Cottonseed explore unit, Solvent extraction plant, etc</td>
</tr>
<tr>
<td>2</td>
<td>With respect to number of machines</td>
<td>Power loom, Spinning mill, Textile mill, etc</td>
</tr>
</tbody>
</table>

Size of the plant depends on the manufacturing process, availability of raw material, capital investment needed and the size of the market. Generally, a large size unit is more economical than a small size unit, but if the establishment of a large size unit needs heavy capital investment or the demand in the market is not sufficient for production at such level or sufficient raw material is not available for large size unit, it may be better to set up a plant of small size.
4.4.1.4. Deciding the Product-mix/Product-range:

Product-mix or Product-range may be decided according to market requirements, production of certain items may have to be done in different sizes and quality to suit different consumers. Sometime, a slight difference in quality may help not only in increasing the sales but also raising profit by having higher margin of profit on higher quality goods.

4.4.1.5. Selecting the Plant and Machinery:

Selection of plant and machine is done according to manufacturing process and size of the unit. Different stages of manufacturing process should have proper balance of capacity. For example, a product has to pass through 4 stages and the capacity of proposed machinery for each stage is as under

<table>
<thead>
<tr>
<th>Production Cycle</th>
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<tbody>
<tr>
<td>Raw Material</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Finished Goods</td>
</tr>
<tr>
<td>Capacity</td>
</tr>
</tbody>
</table>

The total capacity of the plant in above case will be considered as 60 units because the capacity in the third stage of process is only 60 units. If the capacity in third stage is increased, the total capacity of the plant can be raised upto 80 units without increasing the capacity of other stages. Perfect balancing of all stages may not be possible in many faces due to non-availability of certain machines of specific size. However, as far as possible, a unit should have balance of capacity in different stages.
4.4.1.6. Plant Layout:

The efficiency of a manufacturing operation also depends on the layout of the plant and machinery. Proper plant layout can reduce manufacturing cost by saving time and money. Layout can be done basically in following three ways:

| a. Line Layout | Various machines required for a series of operations are arranged in the sequence in which they are used. |
| b. Functional Layout or Process | Various machines are grouped according to the operations they perform, e.g., all the Lathes together. It is also called process layout. |
| c. Group Layout or Product | Various machines are grouped to produce a part or family of parts. It is also called product layout. |

While deciding layout, the following factors are considered:

1. The process flow and flow of materials
2. Storage needed for raw materials, consumable, goods-in-process and finished goods
3. Interlinked storage yards and material handling facilities
4. Utility service systems
5. Inter-departmental communication
6. Future expansion alternatives
7. Environmental aspects and disposal of industrial effluent
8. Safety precautions, particularly when manufacturing process requires handling of explosives
9. Effective supervision of work
Plant layout may be done in such a way that minimum time is taken in handling equipment, raw material, consumable, goods-in-process and finished goods. Plant layout helps in specifying the construction of buildings required for the plant and preparing building plans.

4.4.1.7. Location of Project:

Study of the location includes selection of general location (city/town/village) and also a particular site within the general location. It may be decided keeping in view the relative importance of various requirements of production, which can be summarised as under:

1. Land (area, cost and approach road)
2. Proximity to raw material (sugar, khandsary, cement etc)
3. Proximity to market (food products, soft drinks, ancillaries, etc)
4. Availability of labour (fire-works, handicrafts, power looms, sports goods, etc)
5. Utilities such as water, power, fuel etc
6. Effluent disposal
7. Transportation and communication facilities
8. Community infrastructure (houses, schools, hospitals, shopping centres, cultural activities, etc)
9. Development of other industries not only to serve the varied needs of the project, but also to utilise by-products and/or disposal of waste
facilities for setting up industries in backward areas (tax relief, subsidies, lower rate of interest, etc)

It is always not possible to have all the above facilities at one place. Relative importance of each factor for a project should be studied and location should be decided keeping in view the availability of basic or major inputs required for the project. A comparative study may be done to choose a place where the cost of production is minimum.

The Project Evaluation and Review Technique (PERT) or Critical Path Method (CPM) helps the promoters in proper planning, scheduling and controlling various activities essential for the execution of a project. All possible activities from project identification to commencement of production should be listed. If the project is small and it is not possible for the promoters to prepare PERT/CPM diagram, time taken in each activity can be shown at least in a bar-chart indicating the activities which should be done simultaneously. The preparation of such a chart will help the promoters to undertake various activities at proper time.

The appraising officer should verify whether all the activities have been included and the time schedule given by the promoters is reasonable. If any activity is likely to take more time than that shown by the promoters, he should make an assessment of its effect on other activities because many activities cannot be started till earlier activities are completed. Such an assessment gives an idea about the probable date of commencement of production. It also helps in disbursement of funds according to the
requirements of the project and supervision of project implementation. Delay in the schedule of implementation often leads to overrun in the cost of the project and consequential problems. Therefore, proper evaluation of implementation schedule is necessary for estimation of capital cost (including provision for contingencies) and preparation of cash-flow and profitability estimates.

The above discussion gives an idea to judge the feasibility of a project to produce goods. It is not sufficient to ensure that necessary physical facilities will be available for production but it should also be ensured that the best possible alternative is selected to procure them to have minimum possible cost. Study of different alternatives and selecting the best possible among them makes the technical appraisal more meaningful and relevant. It may be noted that although a project may be technically feasible in terms of availability of physical facilities required for production, it does not justify its implementation unless the benefits, obtained from the project are more than its cost and it is found suitable after commercial, financial, economic and managerial appraisal.

4.2. **FINANCIAL APPRAISAL:**

Financial appraisal is concerned with assessing the feasibility of a new proposal for investment. It involves an assessment of funds required to implement the project and the sources of same. The other aspects of financial appraisal relates to estimation of operating costs and revenues, liquidity and returns when the project will become operational.
One of the important requirement of financial appraisal is the estimation of cash outflows and inflows. Cash flows of projects differ in accordance with the type and scope of their objectives. The cash flows for public sector and private sector projects will also differ. In order to compute the cash flows, the projects are divided into:

- Base Project proposal.
- Surrogate project proposal
- Mutually exclusive project proposal

Figure 4.5 depicts the fundamental approach of financial appraisal.

![Diagram of Financial Appraisal]

**Fig. 4.5. Fundamentals of Financial appraisal**

### 4.4.2.1. METHODS OF FINANCIAL APPRAISAL:

The whole gamut of appraisal techniques constitutes more than thirty criteria for scouting the worthiness of a project. Some of which are customary and
applicable to a wide range of investments while other methods are specialised and suitable for certain types of investment opportunities of development and industrial projects. The more widely accepted techniques can be classified into two groups:

1. **Modern Techniques**
2. **Traditional Techniques**

The modern techniques include Net Present Value, Benefit-Cost ratio and Internal Rate of Return, whereas the traditional techniques comprise of Urgency, Payback Period, and Accounting Rate of Return.

**4.4.2.2. Modern Evaluation Techniques Labelled as DCF Tools:**

The Discounted Cash Flow (DCF) techniques of capital evaluation - especially NPV and IRR (Net Present Value and Internal Rate of Return) - are gaining currency in the project evaluation circles globally by eventually overtaking the traditional models.

**a. The Net Present Value (NPV):**

This is one of the time adjusted group of techniques (DCF), and a method of evaluating profitable investment opportunities of a firm. First of all, the cash inflows and outflows as usual are calculated. These cash flows are expressed in the form of present values by discounting at a cut-off rate (cost of capital). NPV is a scientific method of calculating the present value of cash flows, both inflows and outflows of an investment proposal, using a discount rate and subtracting the present value of outflows to find the net present value.
NPV is calculated by using the following formula

\[
NPV = \frac{A_1}{(1+k)^1} + \frac{A_2}{(1+k)^2} + \frac{A_3}{(1+k)^3} + \frac{A_4}{(1+k)^4} + \ldots + \frac{A_n}{(1+k)^n} - CO
\]

or \( NPV = \sum_{t=1}^{n} \frac{A_t}{(1+k)^t} - CO \)

Where \( A_1, A_2, \ldots, A_n \) are annual cash inflows

\( k \) is cost of capital or discounting rate

\( CO \) is initial cash outflow

\( t \) is from year 1 to \( n \)th year

**Acceptance Rule:**

if \( NPV > 0 \), accept a project

if \( NPV < 0 \), reject a project

if \( NPV = 0 \), employ an advanced method of evaluation i.e., IRR or PI

<table>
<thead>
<tr>
<th>NPV has following limitation:</th>
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<tbody>
<tr>
<td>• Its accuracy is limited by the accuracy of the predicted future cash flows and interest rates</td>
</tr>
<tr>
<td>• It uses a fixed interest rate over the duration of the project. The technique can, however, accommodate varying interest rates</td>
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<tr>
<td>• It allows for inflation and escalation due to economic trends</td>
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<tr>
<td>• It is biased towards short-run projects</td>
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<tr>
<td>• It does not include non-financial data like the marketability of the product</td>
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<table>
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<tr>
<th>The benefits of NPV are:</th>
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<tr>
<td>• It introduces the time value of money</td>
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<tr>
<td>• It expresses all future flows in today's values. This enables direct comparisons between two mutually exclusive projects</td>
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<tr>
<td>• It looks at the whole project from start to finish</td>
</tr>
<tr>
<td>• It gives a more accurate profit and loss forecast than non-DCF calculations</td>
</tr>
<tr>
<td>• It is relatively simple and reliable method of appraising</td>
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</table>
b. Internal Rate of Return (IRR):

The IRR is also called DCF yield or DCF return on investment or Effective Rate of Interest method or Marginal Efficiency of Capital. The IRR is the value of discount factor when the NPV is zero. The IRR is calculated by a trial and error method of plotting NPV against IRR. It is assumed that the costs are committed at the beginning of a year and these are the only costs during the year. Joel Dean is credited for his contributions towards the discovery of this sophisticated discounting technique. The IRR can be computed with the help of this formula

\[ C = \sum_{t=1}^{n} \frac{A_t}{(1+k)^t} \quad \text{or} \quad C - \sum_{t=1}^{n} \frac{A_t}{(1+r)^t} = 0 \]

Where \( r \) => discounting rate
\( A_t \) => annual cash flow up to \( n \)th year

The value of IRR is found by a trial and error method. The computation of IRR is as follows:

- Select any rate for discounting the cash flows and compute the net present value (NPV),
- Check whether NPV is negative or positive,
- If NPV is positive a higher rate of discount should be selected and vice versa,
- This iteration process of selecting the discount rate continues till the computed NPV is equal to zero.
Acceptance Rule:

If the IR > the cost of capital (k) accept the project,

If the IRR < the cost of capital (k) reject the project

Evaluation: IRR is theoretically sound and scientific and is widely applied in appraising various projects globally. The benefits and limitations of this method are summarised hereunder:

<table>
<thead>
<tr>
<th>It suffers from following limitation:</th>
<th>Its benefits are:</th>
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</thead>
<tbody>
<tr>
<td>• Difficult to understand the concepts and explain to convince a layman</td>
<td>• Considers the time value of money. Just as NPV, IRR also emphasises on the time value of money</td>
</tr>
<tr>
<td>• Calculations are compel and cumbersome and there is a chance of committing mistake while performing the task which may lead to wrong decisions</td>
<td>• Considers the cash flow stream over the entire life of a project</td>
</tr>
<tr>
<td>• IRR assumes that the intermediate cash flows generated are reinvested at IRR rate of the project. In a sharp contrast with NPV, the intermediate cash flows are assumed to be reinvested at firm's cost of capital. This assumption seems to be more logical and convincing</td>
<td>• IRR is the rate of return on capital and act as a true measure. This rate of return is more meaningful and acceptable and has a tremendous psychological impact on the executives and financial analysts</td>
</tr>
<tr>
<td>• The results of IRR and NPV may be conflicting and inconsistent when a. projects differ in their expected lives b. projects differ in terms of cash flows c. projects differ in investment outlays</td>
<td>• Unlike NPV, calculation or assumption of cost of capital is not necessary. IRR suggests maximum rate that a project can earn whether the firm's cost of capital is given or not</td>
</tr>
<tr>
<td>• More surprisingly, different rates can be arranged under certain circumstances. Financial analysts get baffled at the possibility of multiple rates and ultimately land in confusion</td>
<td>• Compatible with the corporate objectives of maximizing share-holders wealth. The market price of shares is expected to increase if the firm accepts a project with an internal rate of return higher than the minimum required rate of return</td>
</tr>
</tbody>
</table>
c. **Profitability Index:**

The ratio of present value of expected future benefits discounted at a required rate of return to an initial cash outflow is expressed as profitability index. This is also known as the benefit-cost ratio. Profitability index is calculated by using the following formula:

\[
PI = \frac{\text{Present Value of Cash Inflows}}{\text{Initial Capital Invested (cash outlays)}} = \frac{\sum_{t=1}^{n} \frac{\text{At}}{(1+k)^t}}{C}
\]

**Acceptance Rule:**

- If the PI > 1 accept the project
- If the PI < 1 reject the project
- If the PI = 0, then apply method IRR because NPV will also be zero (when PI and NPV are positively correlated)

**Evaluation:** Profitability index is based on NPV technique. It is an extension of the NPV method. When NPV for two mutually exclusive projects is same but their capital outlays are different, then PI may help in resolving the situation. For instance, if the NPV of two independent projects is Rs 50,000 but one requires a capital outlay of Rs 10,00,000/- and the second project requires an outlay of Rs 8,00,000, then the PI for these two projects can be calculated as under:

\[
\text{PI for the first project} = \frac{\text{Rs.10,50,000}}{\text{Rs 10,00,000}} = 1.05
\]
When NPV ranks both the projects equally, PI further helps clarify the distinction and the most profitable project is selected, i.e., the second project having a higher ratio.

Similar to NPV and IRR methods, the profitability index is conceptually sound in appraising investment projects and considers the time value of money. This method is increasingly applied to choose between several mutually exclusive projects by calculating the incremental benefit-cost ratio. However, this method suffers from some defects such as complexity, tedious computations and vulnerable interpretations, etc.

4.4.2.3. Traditional Evaluation Technique or The Non-discounting Methods:

a. Urgency

In this method the true magnitude of a project is sensed instead of being overwhelmed by flavoured cash flow streams. The most common problem which every analyst faces while determining the degree of its seriousness is to produce timely results. At times it may not be possible to apply all the techniques as the project is time constrained. Under those circumstances, project appraiser need to apply his experience and discretion to arrive at a decision. In certain situations, it may even be vulnerable to identify the genuine exigencies of investment.

In many situations, however, it is difficult to determine the relative degree of urgency because of the lack of an objective analysis. This method may be misused by
political influences thereby overpowering norms set for appraisal. Resource allocation may degenerate into a political battle. In view of these limitations it is suggested that as a general pattern of appraisal it should be used for investment decision making. In exceptional cases, where genuine urgency exists, it may be used provided investment outlays are small.

b. Payback Period:

This method also known as the payout period, is one of the most important and traditional techniques used for evaluating the general (simple) projects requiring small amounts. Simply stated, the payback refers to the time period within which the costs of investment can be covered by the revenues. In other words, it is the length of time required for the stream of cash proceeds produced by an investment to equal the initial expenditure incurred. This can be computed by applying the following formula:

\[
\text{Pay Back period} = \frac{\text{Investment (total initial outlay)}}{\text{Amount of cash inflow}}
\]

For example, a project requires an outlay of Rs. 1,00,000 and yields an annual cash inflow of Rs. 20,000 for eight years. Then the payback period can be computed by dividing the total outlay by cash inflow.

\[
\text{PB} = \frac{1,00,000}{20,000} = 5 \text{ Years (The total outlay can be recovered in five years.)}
\]

In case of unequal cash flows, the payback period can be calculated by summing up the annual cash inflows periodically till it equals initial cash outlays.
Acceptance Rule:

If the Actual Payback < Expected or Predetermined Payback Accept the project

If the Actual Payback > Expected or Predetermined Payback Reject the Project

The shorter the payback the more desirable and feasible the project may be

This method can also be used for ranking the projects when too many alternatives are furnished

<table>
<thead>
<tr>
<th>Its limitations:</th>
<th>Its benefits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignore the returns after the payback period</td>
<td>Simple in concept, understanding, and applying</td>
</tr>
<tr>
<td>Ignores time value of money where cash flows are simple added without discounting them at a suitable, cut-off rate It completely ignores the magnitude and timing of cash inflows</td>
<td>It does not consume much time of a finance executive to compute payback period</td>
</tr>
<tr>
<td>Ignores the total life of a project Payback method considers only the recovery period of investment</td>
<td>Thus method has few hidden assumptions and the calculations are not tedious and mind numbing</td>
</tr>
<tr>
<td>Measures project's capital recovery, not profitability Payback emphasises earlier capital recovery and ignores totally the profitability of the project</td>
<td>It emphasises liquidity or solvency of the firm</td>
</tr>
<tr>
<td>Inconsistent with the firm's objective As James Porter field contends &quot;it would be consistent with the firm's objective if share values were a function of payback periods of investment projects &quot;</td>
<td>It weighs all returns equally, ignoring even distant returns This method has an inherent hedge against economic depression</td>
</tr>
<tr>
<td>This is suitable only to small projects consuming less investment and time</td>
<td>It enables a firm to choose an investment which yields quick return of funds</td>
</tr>
<tr>
<td>The results are not purely reliable as it does not cover all aspects viz., time value, inflationary trends, profitability, etc</td>
<td>This is a sensible criterion which emphasizes early cash inflows especially when the project is hard pressed with the problem of liquidity</td>
</tr>
<tr>
<td></td>
<td>This method reduces the possibility of loss on account of obsolescence because it prefers investment in relatively shorter projects</td>
</tr>
</tbody>
</table>
c. Accounting Rate of Return:

This is also labelled as average Rate or return. This is the second best method of traditional group of techniques for evaluation. One notable feature of this ARR is that this depends on accounting profits rather than cash inflows unlike the Payback method. The accounting rate of return is calculated by applying the following formula

\[ \text{ARR} = \frac{\text{Average Income}}{\text{Average Investment}} \]

where, Average Income = Average Profits After Taxes, and

\[ \text{Average Investment} = \frac{\text{Original investment} + \text{Investment at the end}}{2} \]

However, when an equipment/asset (investment opportunity) has salvage value, and when some working capital is required, average investment is calculated as follows

\[ \text{ARR} = \left\{ \frac{\text{Initial Cost} - \text{Salvage Value}}{2} + \text{Working Capital} + \text{Salvage Value} \right\} \]

\[ \text{AI} = \frac{\text{Initial Cost}}{2} + \frac{\text{Salvage Value}}{2} + \text{Working Capital} \]

Acceptance Rule.

If ARR is more than the predetermined rate the project can be **accepted**.

If ARR is less than the predetermined rate the project may be **rejected**.

The ranking of mutually exclusive projects depends on the higher ARR.
For instance, if the initial investment on a project is Rs 40,000 (purchase of a machine) whose life is eight years. The Working capital requires is Rs 8,000 and the salvage value of the machine is Rs 4,000. Then the average investment can be calculated as follows:

\[
\text{Average Investment} = \frac{40,000 + 4,000}{2} + 8,000 = \text{Rs. 30,000}
\]

Its limitations are:

- Most frequently, ARR is calculated on the basis of accounting income, not cash flows. Cash flow approach is more superior over accounting.
- Ignores the time value of money. Profits occurring in different periods are treated equally.
- Decision making will be chaotic when two or more projects have the same ARR.
- Ignores reinvestment of profits achieved over a period time.
- Incompatible with the firm's objectives.
- This method is internally weak and inconsistent in the sense that comparison between shareholding funds and the investment on fixed assets is not the right criterion which can never be the same.

Its benefits are:

- ARR is simple to understand and easy to calculate.
- Accounting data is used without involving cumbersome cash flow calculations.
- Unlike the payback method, the total benefits associated with the project are taken into account.
- In sharp contrast to the payback, it concentrates on profitability of investment rather than liquidity or cash flow operations.
- This method does not call for special mathematical abilities on the part of the appraiser. Knowledge of simple maths will help him through.

4.4.2.4. Scoring factor Model:

Typically all the above debated models focus on a hackneyed view of the 'financial strengths' of a project. Another sincere attempt is made to sieve and leech-ooze the projects by scanning through a scoring model called the 'factor model' that
encompasses multiple criteria to evaluate project viability. This 'factor model' simply lists a number of desirable factors on a project selection proforma along with columns for 'selection' and 'not selection'. The development of this list certainly needs senior management input and approval. Following is an example of such a checklist:

<table>
<thead>
<tr>
<th></th>
<th>Select</th>
<th>Not select</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Profit 20%</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>Enter new market</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>Increase market share</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>No new equipment required</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>Use equipment not being utilised</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>No increase in energy requirements</td>
<td>✓</td>
</tr>
<tr>
<td>7</td>
<td>No new technical expertise required</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>Use unutilized work horse</td>
<td>✓</td>
</tr>
<tr>
<td>9</td>
<td>Manage with existing personnel</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>No outside consultants required</td>
<td>✓</td>
</tr>
<tr>
<td>11</td>
<td>No impact on environmental issues</td>
<td>✓</td>
</tr>
<tr>
<td>12</td>
<td>Payback period 2 years</td>
<td>✓</td>
</tr>
<tr>
<td>13</td>
<td>Consistent with current business</td>
<td>✓</td>
</tr>
<tr>
<td>14</td>
<td>Offer good customer service</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>8 6</td>
</tr>
</tbody>
</table>

The factors can be weighted on a 1 - 5 scale.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Poor</td>
<td>Poor</td>
<td>Fair</td>
<td>Good</td>
<td>Very good</td>
</tr>
</tbody>
</table>

The advantages and disadvantages of the scoring model are as follows:

**Advantages**

- Uses multiple selection criteria to widen the range of evaluation
• Simple structure, therefore easy to apply
• The selection factors are structured by senior management and reflect the company goals and objectives
• Easy to change factors
• Weighted scoring reflects the factors differential importance
• They are not biased towards short-run projects favoured by financial models
• Very long weighting can be removed from the list that have little or no influence. This will reduce the number of questions on the checklist.
• The scoring model can also be used as a flag to improve projects by identifying variance between the factor score and the maximum possible score

Disadvantages
• If the factors are not weighted they will all assume equal importance
• A simple model may encourage the development of long lists which could introduce trivial factors and may waste management time

4.4.2.5. Break-Even analysis:

Estimation of working results presupposes a definite level of production and sales and all future calculations are based on that level. It may, however, not be possible to realise those levels at all times. The minimum level of production and sale at which a unit will continue to run is ‘no profit no loss’ also called the break-even point, and the first goal of any project is to reach that level. The break-even point can be expressed in terms of
volume of production or as a percentage of plant capacity utilisation. For the purpose of computing break-even point of sales, the cost of production may be divided into two:

- **Fixed costs:**

  Costs which are unrelated to the column of production and remain unchanged for a specific period of time. Examples include buildings, depreciations, salaries and interest on long-term loan, etc.

- **Variable costs:**

  Costs having a positive correlation with the volume of production and change accordingly. Examples are material costs, fuels, direct labour costs, packaging, etc.

The emphasis in BEP analysis is on contribution margin. The difference between the per unit sale price and the variable costs per unit will be equal to `contribution per unit of output sold`. This contribution will be used to cover the total fixed costs. The calculation of BEP is, therefore, as follows:

\[
\text{BEP (Units)} = \frac{\text{Total fixed costs}}{\text{Contribution per unit}}
\]

Often, this tool is used to help decision-making where two mutually exclusive projects present a different cost structure. Consider a project to install a heating system for an office block. Project A has a high installation cost but low maintenance, while Project B has a low installation cost but high maintenance costs. In such mutually exclusive and independent projects, the break-even analysis will help indicate which system is the cheapest and cost effective for a given period of time.
4.4.2.6. Domestic Resource Cost (DRC):

This helps to establish a relationship between the total rupees spent towards domestic resources for manufacturing a product against the possible amount of foreign exchange outlay that may be necessary to import that particular product. It may be taken as a measure of total rupees spent to save a unit of foreign currency (for import substitution) or to earn a unit of foreign currency (for products to be exported). This may, in turn, be compared with the exchange rate (parity rate) of the unit of foreign currency in rupees to determine if it is worthwhile to manufacture the product in the country. If DRC is equal to or less than the parity rate of the unit of foreign currency, it means manufacturing the product in India (indigenously) is possible at a cost which is equal to or lower than the cost of foreign exchange and it is worthwhile to implement the project. However, as foreign exchange is scarce, projects with slightly higher DRC (than parity rate) may also be approved keeping in view other important factors such as employment potential or Government policy to create manufacturing capacity at home due to strategic importance of the product or to gain a position in the international market, etc. The following figure shows how this parity is done.

[Diagram showing the decision process between Domestic Resource Cost (DRC) and Foreign Exchange (Forex), comparing them to determine if it is worthwhile to manufacture the product in India.]

Fig. 4.6. DRC vs. Forex: A parity between domestic and foreign currency.
4.4.2.7. Sensitivity Analysis:

The objective of sensitivity analysis is to determine the true impact of market fluctuations on the size of the project. It may not be sufficient to measure the impact by applying a single parameter rather it may necessitate to observe various permutations and combinations of changes. Usually, this technique is often applied during the project planning stage, when decisions concerning major inputs are being taken. The element of uncertainty could be diminished at this stage by finding the optimistic and pessimistic alternatives, in order to determine the most realistic combination of production factors. This exercise can be performed in many ways. For example, by selecting only the pessimistic solutions, one can determine the project's viability in the worst of all possible worlds. With the help of sensitivity analysis it is easy to identify the most important factors in a project, such as raw materials, labour and energy, and to determine any possibilities of input substitution.

- **Its merits are:**
  
  - this method forces the management to focus on changing variables that may affect forecasts of cash flows and helps get a better picture of the opportunity,
  
  - the critical viables are identified to take necessary action,
  
  - the management gets a clear direction to concentrate on relevant areas by overcoming misappropriated forecasts
• It suffers from the following limitation:
• this can be interpreted differently by different team members and may not give crystal clear results, there is inconsistency in the range of values derived,
• the interrelationship between variables is not defined and the net effect upon one another cannot be known

4.4.2.8. Probability Analysis:

Probability analysis is carried out in the context of project preparation with the objective of improving the accuracy of cost estimates and, in turn, of profitability forecasts. Probability analysis attempts not only to forecast variables from optimistic and or pessimistic estimates but to widen the range considerably and to determine the probability of occurrence for each value of a variable. Such an exercise naturally requires a number of judgements by people particularly qualified in the subject under review. With the introduction of probability analysis the number of computations increases considerably since for each variable several values are needed to be computed in addition to the probability forecasts of occurrence

4.4.3. Economic Appraisal:

Developing countries have serious constraint of capital and foreign exchange and therefore they wish to utilise the limited stock of capital and foreign exchange in the best possible way which include inter alia generation of employment, economic upliftment of weaker sections and development of backward areas. The financial appraisal and market appraisal do not ensure the achievement of these objectives.
and therefore, many economists prefer to calculate economic rate of return from financial projections prepared on the basis of shadow prices which may reflect socially desirable use of each input and output. United Nations Industrial Development Organisation (UNIDO) and Organisation for Economic Co-operation and Development (OECD) have evolved certain principles to decide shadow prices. According to UNIDO method, shadow prices are decided on the basis of willingness to pay as measured by consumer surplus. According to OECD method (Popularly known as Little - Mirrlees technique), border prices provide the basis to decide the shadow prices.4

Financial institutions (including Banks) in India follow the guidelines issued by the Government regarding priorities for financing instead of calculating economic rate of return based on shadow pricing.5

a. UNIDO Method:

Both UNIDO and OECD approaches postulate the existence of a Central Project Evaluation Agency (CPEA for short) but the UNIDO approach regards it as a small but vital branch of the Economic Ministry. The CPEA is informed of all national objectives and fed with information of a factual nature on projects which are envisaged by the ministries. This body has to make recommendations with regard to the overall desirability of the Project.

The UNIDO objective is maximising aggregate consumption benefits. In calculating consumption benefits, consumers' willingness to pay for the net output of the project has to be assessed. Net output refers to goods and services made available which
would not have been available in the absence of the project. Costs are measured by the maximum alternative benefits foregone as a result of using resources and services in this project. If the goods and services produced do not add to the supply available but substitute for an alternative source leaving the total supply constant, net output is reflected by resources released from an alternative source of supply. If the output is import-substituting or export-promoting the impact of foreign exchange availability is assessed by converting the foreign exchange benefits at shadow prices into units of aggregate consumption in domestic currency.

So much for direct benefits and costs. We now turn to indirect benefits and costs.

- **Indirect Benefits:**

  To the extent a project influences current investment and not consumption it does not provide direct consumption benefits but indirect benefits since the purpose of investment is to have future consumption. In developing societies, where national savings are often below the social optimum, marginal increases in investment at the expense of consumption should be considered a gain to society, the shadow price of investment is higher than unity; the social rate of discount is less than the social rate of return to investment.

  The wage bill to unskilled labour is greater than the opportunity cost which in turn depends on the extra consumption generated weighted against the reduction of reinvestment possibilities as a result of the employment and wage bill generated. The
shadow wage rate depends on the going wage rate price of reinvestment and labour's opportunity cost.

The evaluation of the indirect benefits (costs brought about by such reinvestment) or investment sacrificed involves the multiplication of the net change in investment by the excess of the shadow price of investment over the shadow price of consumption.

For a given project, the algebraic sum of the present values for the years of its lifetime yields the present value of the net aggregate consumption benefits, using the social rate of discount. If it is positive, the project is recommended; if negative, it is rejected.

b. OECD Method (Little-Mirrlees or L-M):

In the OECD approach, the CPEA is a more powerful office. It can comment on the general policies of the government vis-a-vis national objective.

The OECD approach points out that some commodities are not traded (like power and construction). Hence, a benefit cost analysis at world prices is rendered difficult. Projects are divided into three categories:

1. Traded goods and services
   a. Which are exported or imported
   b. Which would have entered international trade if optimum policies had been followed

2. Non-traded goods and services
III. Unskilled labour.

a. The opportunity cost of traded goods is thrive value in trade. The possibility of external exchange at fixed prices separates the decision of what to produce from that of what to consume. Hence L - M base their procedure of valuing social costs and values by referring to the opportunity costs on the world market. If the world price value of the projects outputs exceeds that of inputs, there could be a net gain of foreign exchange reserves, which is a yardstick of the social benefit, because if expenditure had initially been constant, the country could not increase expenditure without running down the reserves held before the project was started.

The above analysis applies, however, only to fully traded goods which can be regarded as homogeneous and perfectly substitutable for foreign exchange. The approach is not applicable to part all traded goods which are exchanged internationally but whose external prices are not independent of internal conditions.

Comparison:

Both approaches do not use market prices and use shadow prices to measure social benefits and costs. Shadow value is used to judge industrial projects. The OECD approach uses investment (expressed in foreign exchange) as the unit of measurement and consumption (by skilled labour) is revalued in terms of investment (using the shadow price of consumption in terms of investment). In the UNIDO approach, investment is revalued in terms of consumption.
There are also more fundamental differences between the two approaches in project analysis which need scrutiny.

Any excursion into the field of planning is exercise is constrained maximisation. People agree on the constraints and the objective functions. Basically, the UNIDO guidelines would appear more concerned about the kinds of situation where the CPEA will not be circumspect in use of world prices of tradeable goods for public sector project evaluation. The OECD manual offers clear cut rule. It is more detailed in spelling out operational specifications. The ultimate difference is in the role of the CPEA.

4.4.4. Market Appraisal:

The project appraisal exercise often begins with an estimate of the size of the market. In order to have proper appraisal of the demand forecast made by borrowers, the lending institutions require information regarding demand, supply, distribution, pricing and external forces. The information required by them can be classified under 5 major headings:

- Demand: Present & future demand.
- Supply: Installed Capacity, Capacity utilisation, and possibility of imports.
- Distribution: Available channels, their cost and mode of transportation.
- Pricing: Price trends, Government Control, duties and taxes.
- External forces: Government policies regarding industrialisation, foreign collaboration, etc.
4.4.4.1. Techniques on Market Appraisal:

For forecasting the aggregate demand several techniques are available in the hands of appraiser. Some of the techniques are as under:

a. **Import Substitution:**

   Certain chemicals, pharmaceuticals, engineering goods and accessories are still imported into the country. In certain cases the entire requirements are imported. If the unit under review proposes to manufacture only a part of the goods imported, the procedure that needs to be adopted is fairly simple as under:

   i. Obtain past trends in imports

   ii. Obtain details of other units, if any, producing or likely to produce

   iii. Obtain imported prices (c.i.f.) and duties and check the competitiveness of the price at which indigenous product is to be marketed.

   iv. Ascertain the channels and cost of distribution

   v. Ascertain the product specifications and quality

b. **Past Trend Method:**

   This method is used when several years data for a product are variable and when relationship and trends are clear and relatively stable. In such cases, a study of these past relationships and trends is made and it is assumed that the same will continue in future and thus will determine the future demand conditions. For instance, if the aggregate demand for a particular product has been growing at a certain rate over the past ten years, it is assumed that it will continue to grow at the same rate in future.
c. **End Use Method:**

This method is generally used while dealing with industrial intermediaries or inputs. The basic steps in an End Use Study are as follows:

1. Determine the end-uses of the product under review
2. Determine consumption norms in each of the end-uses identified
3. Determine present and future growth of the end-uses
4. On the basis of the norms of consumption, determine present and future demand for the product

**d. Correlation and Regression:**

In certain cases, the definite relation between the supply and demand of one product and the demand for another may be found. In other words, a relatively independent variable may in some way determine the demand for a relatively dependent variable. In such cases, the growth and future prospects for the independent variable are examined and the prospects for the dependent variable are derived from that.

Ascertaining the demand alone is not sufficient to study the commercial feasibility of a project. Many times although uncatered demand is available in the market, a unit may not be able to sell its product. Knowledge of proper pricing policy, distribution policy, advertising policy and many other aspects of marketing is also essential to sell products.

Salesman are eyes and ears for any manufacturing firm; they get necessary information from the market and advise the firm to make suitable changes in its production.
programme, wherever necessary. However, their importance is more for industrial goods as compared to consumer goods.

4.4.4.2. Sources of Market Information:

The sources of market information can be classified as primary sources and secondary sources. Primary sources are those sources which can directly provide all or part of the information and include consumers, traders, trader's organisations/associations, competing manufacturers, manufacturer's associations, government departments and agencies, research institutions, knowledgeable circles, other financial institutions and banks, consultancy organisations and last but not the least the client himself who in many instances has prior knowledge and even experience in the marketing of the product under review. Following steps may be taken to collect information from primary sources:

i. Determine the type of information required

ii. Determine the source(s) of information

iii. Design the sample and select the parties to be contacted

iv. Prepare the data collection form or questionnaire

v. Give prior information to the concerned parties regarding purpose of the visit and the information required. An assurance may have to be given to treat the information as confidential

vi. Collect the information

vii. Analyse the information collected and prepare the market report
It is difficult to collect information from primary sources for all projects and an appraising officer may have to depend on secondary sources of information which include published material pertaining to the product and the market for it. It may be published by Government, research institutions, manufacturer's associations, consultancy organisations, International agencies and even other financial institutions/banks. Many newspapers, journals and company balance sheets also give information about marketing prospects of many commodities.

4.4.5. Management Appraisal

It is said that a second rate project in the hands of first rate management is better than a first rate project in the hands of second rate management. The experience of sick industrial units indicates that many of them have been rendered sick owing to inefficient or dishonest management. Therefore, proper evaluation of management is a highly essential part of appraisal of a project. However, it is often difficult to form a judgement regarding future management at the time of project appraisal. Evaluation of management is an art and no formula or well recognised steps exist for its easy solution.

Appraising officer should evaluate the qualities of the promoter after interviewing him two-three times.

A check-list giving qualities of an entrepreneur is given to judge promoters of a project. However, the first four qualities are having higher importance than the other qualities mentioned in the check-list. Therefore, the first four qualities may be given double weightage than the other qualities-20, 12 and 4 marks may be given for each of the
first four qualities for securing excellent, good or poor ranking respectively and similarly, 10, 6 and 2 marks may be given for each of the last six qualities for securing excellent, good or poor ranking respectively. Accordingly, ten qualities mentioned in the check-list will carry 140 marks as the first four qualities are having double weightage. If an entrepreneur gets about 60% marks, he may be considered as a good entrepreneur. Such type of marking should be done after interviewing the entrepreneurs two-three times in connection with the information submitted by them regarding the project.

**Checklist of qualities of an entrepreneur**

<table>
<thead>
<tr>
<th>Description</th>
<th>Excellent</th>
<th>Good</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Character</td>
<td>Honest and keeps his word under all circumstances</td>
<td>Makes sincere efforts to honour his words</td>
<td>Does not bother much to honour his words</td>
</tr>
<tr>
<td>2 Involvement in the project</td>
<td>Highly involved only source of income</td>
<td>Has other sources of income</td>
<td>Does as part time activities</td>
</tr>
<tr>
<td>3 Financial Resources</td>
<td>Has enough financial resources to meet not only the requirement of promoters' contribution but also to finance small over-run in the cost of project</td>
<td>Has sufficient financial resources to meet the requirement of promoters' contribution</td>
<td>Many have to borrow to meet the requirement of promoters' contribution</td>
</tr>
<tr>
<td>4 Competence</td>
<td>Has knowledge and experience relating to the project</td>
<td>Has knowledge or experience relating to the project</td>
<td>Has neither experience nor knowledge relating to the project</td>
</tr>
<tr>
<td>5 Initiative</td>
<td>Excellent</td>
<td>Good</td>
<td>Poor</td>
</tr>
<tr>
<td></td>
<td>(10) Highly alert to opportunities</td>
<td>(6) Performs work with just the general guidance</td>
<td>(2) Routine worker, awaits directions</td>
</tr>
<tr>
<td>6 Intelligence</td>
<td>Very quick in understanding pertinent points of a problem</td>
<td>Understands the problem after reasonable explanation</td>
<td>Takes time to understand the implications of any action</td>
</tr>
<tr>
<td>7 Drive and Energy</td>
<td>Always highly energetic</td>
<td>Fairly energetic</td>
<td>Avoids hard work</td>
</tr>
<tr>
<td>8 Self abilities</td>
<td>Believes strongly in himself and his abilities</td>
<td>Has faith in his abilities</td>
<td>Believes in luck</td>
</tr>
<tr>
<td>9 Frankness</td>
<td>Talks frankly about the weak points of the project</td>
<td>Prepared to talk on weak points of the project</td>
<td>Avoids talking on weak points of the project</td>
</tr>
<tr>
<td>10 Patience</td>
<td>Has patience and does not expect quick results</td>
<td>Appreciates the time taken by lending institutions in appraisal</td>
<td>Wants quick results</td>
</tr>
</tbody>
</table>
Although the assessment is highly subjective, it gives an idea about the qualities of the promoters. If promoters are coming into contact with more than one appraising officer, all of them can do above ranking independently after meeting the promoters at least two-three times. An average can be obtained from the assessment independently done by different appraising officers.

4.4.5.1. Management Problems:

A few typical management problems can be summarised as under:

<table>
<thead>
<tr>
<th>Problems</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Conflict among the promoters</td>
<td>Conflict may arise owing to serious differences regarding appointment of building contractor, purchase of plant and machinery, appointment of Managing Director and other senior executives</td>
</tr>
<tr>
<td>II Conflict among executives</td>
<td>a. Lack of effective leadership at the top</td>
</tr>
<tr>
<td></td>
<td>b. Activities of various departments are not properly defined</td>
</tr>
<tr>
<td></td>
<td>c. Conflict may arise in matters relating to use of staff cars, company housing, foreign travel, etc.</td>
</tr>
<tr>
<td>III Autocratic style of management</td>
<td>a. Lack of delegation of powers to professional staff and frustration among them</td>
</tr>
<tr>
<td></td>
<td>b. Second line of corporate leadership is not allowed to develop</td>
</tr>
<tr>
<td>IV Misuse of financial resources</td>
<td>Lack of proper control, siphoning of funds, excessive travel, entertainment and hotel bills, maintaining posh guest houses, etc</td>
</tr>
<tr>
<td>V. Lack of expertise</td>
<td>Recruitment of incompetent executives and lack of proper training</td>
</tr>
</tbody>
</table>

The above problems cannot be solved by any single action. A combination of the following actions may be useful to reduce the management problems:

i. Proper evaluation of the promoters may be done at the appraisal stage

ii. Company's Board of Directors may be broad-based and nominee(s) of financial institutions may be included at initial stage itself

iii. A management Committee or Committee of the Board may
be constituted having nominee(s) of financial institutions, 2-3 members of the Board and senior executives of the company

iv. Meetings of the company's Board and Management Committee may be held at least once in a month and once in a fortnight, respectively

v. Selection of the chief executive and other senior executives may be done according to the requirements of the project.

vi. If necessary, promoters may be backed by adequate consultancy arrangements

vii. A scientific system for recruitment of personnel maybe evolved and, if necessary, suitable training for top level and middle level managers may be arranged at the appropriate time

viii. Division of work among various departments may be defined

ix. Necessary powers may be delegated to the heads of departments.

x. Proper accounting system comprising budgetary control, costing, financial planning, internal audit and inspection may be adopted

4.7 CONCLUSION:

Appraisal is an ex-ante analysis of the effects of implementing a project. The appraisal is carried out by the promoters of project, by the merchant banker and the financial institutions. Project appraisal is indispensable because the resources are scarce and alternative opportunities in terms of projects exist for commitment of resources. Project selection can be rational if it is superior to others in terms of commercial profitability or an national profitability to the nation as a whole. The purpose of the
project appraisal is to ensure that the project is technically sound, provides reasonable financial return and conforms to the overall economic and social policy of the country.

**Technical appraisal** is undertaken to compare and evaluate alternative variants of technology, of raw materials to be used, of production capacity, of location and of local production versus import. It is concerned with the project concept covering technology, design scope and content of the plant as well as input as well as infrastructural facilities planned for the project. The project should deliver marketable product from the available resources at the minimum cost without compromising the quality. Technical appraisal has a bearing on the financial viability of the project as reflected by its ability to earn satisfactory return on the investment made and to service equity and debt. Technical appraisal shall also include project charts, layouts and work schedule. Since alternative technologies are often available, appropriate technology will be selected with due consideration to plant capacity, inputs, utilities, investment outlay, production cost, product mix and new developments. The technology may be acquired by licensing or by outright purchase or by joint ventures. While selecting technology, the socio-cultural environmental factors should be given due importance.

**Financial appraisal** involves finding out the funds required for project implementation and means of financing the same. The project's direct benefits and costs are estimated at the prevailing market prices. Financial projections for a period of about ten years have to be made. For an existing project requiring expansion/replacement, the latest financial statements have to be analysed. The cost of the project shall include the cost
The various techniques of financial appraisal can be broadly classified as traditional techniques (pay back period, accounting rate of return) and modern techniques of discounted cash flow. The methods should have three properties to lead to consistently correct decisions. First, it should consider all cash flows over the entire life of the project, secondly, it should take into account the time value of money and finally, it should help to choose a project from among the mutually exclusive projects which maximise the value of the firm's stock. The traditional techniques employ annual data at their face value. They do not take into account the life span of the project. The modern techniques on the other hand, take into consideration the entire life of the project and their timings. The future cash inflows are discounted to their present value and matched with the present and future outflows. Another integral part of financial appraisal is financial analysis with major emphasis on liquidity and capital structure. For this purpose, the technique of ratio analysis is frequently used. Another important aspect of financial appraisal is the determination of Break Even Point (BEP). Unless it is determined, other measures make no sense. BEP occurs at that production/sales level at which the net operating income of the firm is zero. Tax factor is another important factor of financial appraisal, tax rates, tax exemptions, tax holidays, rebates, deductions, and tax incentives together with the formalities required in tax compliance are considered.
The nature of economic appraisal varies from project to project. While an elaborate analysis is carried out in some projects having far-reaching implications, in most of the cases it is performed in sketchy terms. The economic appraisal of a project deals with the impact of the project on economic aggregates. The appraisal techniques can be classified into two broad categories: the first deals with the effect of the project on employment and foreign exchange, and the second deals with the impact of the project on the net social benefits. Social Cost Benefit Analysis (SCBA) is an important methodology developed for evaluating the projects from a social point of view. It proposes to describe and quantify the social advantages and disadvantages of a policy in terms of a common monetary unit. Net social benefit entails that gains and losses be valued in a common unit. SCBA, though primarily meant for public investment projects, has also become relevant to private investment projects because such projects have also to be approved by various governmental and quasi-governmental agencies. In India, SCBA of projects is carried out mainly by the Project Appraisal Division (PAD) of Planning Commission. The PAD follows a modified version of Little-Mirrlees method.

Market appraisal requires a description of the product, its major uses, scope of the market, potential competition, special features of the product with regard to quality and price. Estimates have to be made about existing and future demand and supply of the proposed product. Estimation of demand requires the determination of the total demand for a product and share that can be captured by the unit. The commonly used techniques of demand forecast are trend analysis, regression analysis, and end-use method.
Demand projections and estimates are made by agencies of government as well as industry associations. Several private consultants undertake market surveys for a fee.

**Management appraisal** is essential because management capability will guide the project which constitute the core requirement for project success. Promoter's past experience in managing enterprises, financial soundness, technical background, etc., are factors to be examined for getting an appreciation of how effective the project management will be. His stake in the project in terms of capital contributed and commitment to its immediate and long-term goals have to be ascertained.

The competence and capabilities of the key management personnel have to be given a close look. The specific development plans for improving and sustaining technical and managerial skills have to be studied, and the assignment of project construction and administration responsibilities to key project personnel reviewed and approved. Financial institutions also decide on having their nominee directors on the Company's Board.
NOTES AND REFERENCES:


2. Rao, P C K, op cit, p 71


(iii) Little & Murrless, *Project Appraisal and Planning for Developing Countries*, OECD Paris

5. Sarda, D P, op cit, pp 137 - 138