Project Cost Estimation

4.1 COST OF THE PROJECT

Correct estimation of the capital cost of a project is the foundation over which the edifice of financial appraisal stands. Resources for the project are tied up after the project cost is estimated. If the project cost is under-estimated, the project will run short of funds during implementation and there is risk of the project coming to a grinding halt if the promoter is not able to bring in additional capital to meet the increase in project cost or if the bank/financial institution that has extended financial assistance for the building up of fixed assets of the project does not come forward to extend additional loan to meet the increase in project cost. This emphasizes the need for a correct estimate of the project cost. On the other hand, if the project cost is over estimated, it leads to a situation where more funds (equity and debt together) are available than required and under these circumstances it is more likely that the promoters may divert the resources for other purposes which again is detrimental to the interests of both the promoters and the financing institutions.

4.2 COMPONENTS OF CAPITAL COST OF A PROJECT

The following are the components that constitute the capital cost of any project.

(i) Land.
(ii) Land development.
(iii) Buildings.
(iv) Plant and machinery.
(v) Electricals.
(vi) Transport and erection charges.
(vii) Know-how/consultancy fees.
(viii) Miscellaneous assets.
(ix) Preliminary and preoperative expenses.
(x) Provision for contingencies.
(xi) Margin money for working capital.

We will discuss in detail about the individual components that make up the project cost, in the following pages. The aim in deciding upon the various components of project cost should be to reduce the cost to the minimum, keeping the functional requirements adequate.

(I) Land

Before deciding upon the extent of land required for the project, the cost of land etc., the first question to be asked is whether it is essential to invest on land and building. If the project is small in
size, the possibilities of acquiring a building on lease may be thought of. The comparative cost advantages and the effect on profitability between the two options viz., starting the project in a leased building and starting the project in owned building by acquiring land and constructing building thereon may be studied. Small projects can be started in leased building, which will reduce the cost of investment considerably. It may be noted that it is only the plant and machinery that are going to produce goods and building only acts as a shelter to house the production facilities and investment on building is not directly going to add to the production capacity. However, this cannot be the case always. Buildings suitable for the chosen project may not be always available on lease. Some projects may require building of certain minimum sizes/specifications, in which case it will not be possible to identify a building on lease that is suitable for meeting the requirements of the project.

The component 'Land' comes into picture only after having decided to purchase land and construct building instead of starting the project in a leased premises.

The extent of land should be so chosen that it is neither too large as to inflate the cost of the project nor too small as to provide no leeway for making additions/alterations to the building and for future expansion.

The extent of land required for a project can be estimated after deciding upon the building plan. Sufficient allowances for open space around the building should be provided for. Also open space shall be provided to take up expansion proposals that may come up in the near future. In respect of industries where raw materials are stored in the open, sufficient vacant land should be available. For example, wood working units store a large volume of wooden logs in open space. Similarly, steel foundries and steel re-rolling mills also stock raw materials in huge quantity in open yards. Sufficient vacant land surrounding the building should be available to take care of the above requirements. If there are plans to go for expansion/diversification in the near future, say within a span of three years or so, the extent of land should be chosen accordingly, since it may not be possible to acquire additional land when required, if the adjacent lands have already been put into some use by the owners. The cost of land includes the legal charges payable for registration of sale deeds.

(II) Land Development

Land development charges include cost of levelling of land, cost of laying internal roads, cost of providing fencing and gates. Land development charges deserve to be carefully assessed since this is an area where there is a likelihood of under estimation if detailed and correct estimates are not made.

(III) Buildings

Provisions for different types of buildings shall be envisaged and provided for. The following are the types of buildings that are normally required for any project.

- Main factory building.
- Ancillary factory buildings.
- Administrative buildings.
- Laboratory.
- Godowns.
- Toilet blocks.
- Overhead/Underground water storage tanks.
- Canteen, rest rooms, guesthouses.
- Quarters for essential staff etc.
The plant layout suited for the proposed project should be studied and analyzed. The size of the main factory building depends upon the plant layout. It must be ensured that the built-up area of different buildings proposed are sufficient to meet the requirements and that no unnecessary construction is done. Type of roofing plays a major role in determining the cost of building since the nature of super structure (walls, columns, beams etc.) depends upon the type of roofing. Office/Administrative buildings are normally constructed with reinforced concrete slab roofing as this gives a dust proof and sound proof environment and is also suitable for air-conditioning of rooms. Factory hall, godowns and other buildings are normally provided with industrial roofing, which may be a combination of steel/concrete trusses and A.C.C. sheet/G.I. sheet roofing sheets. This type of roofing reduces the cost of construction considerably as compared to a building with reinforced concrete roofing. The height of factory building should also be correctly decided after taking into account the height of machinery proposed to be erected, the headroom required for operating the plant and machinery, the requirements of overhead cranes if any etc. After having arrived at the size and design of different buildings, their cost of construction can be arrived at by preparing a detailed estimate, entrusting the work to a qualified civil/structural engineer.

(IV) Plant and Machinery

**Indigenous Plants:** While choosing machinery suppliers, their reputation and past performance act as the leading indicators. Performance of machinery supplied by them earlier are to be seen to have a first hand knowledge. Quotations from a few reputed machinery suppliers can be obtained and a comparative study of the prices quoted by them can be done before deciding upon a particular supplier. Cost of indigenous plants include basic price plus sales tax, octroi and other taxes, if any. Apart from price, other factors like the market reputation of the supplier, the differences in machinery specifications of different suppliers, their service network to effect after-sales-service are also to be considered and these factors are to be properly weighed before arriving at a decision.

**Imported plants:** The cost of imported plant and machinery is the sum of the F.O.B. (Free-on-Board) value of the plant to be imported, the shipping/Air cargo freight charges, marine/air insurance charges, import duty payable on the machinery, clearing charges, loading and unloading charges at different places etc. It is always advisable to import necessary spares along with the main machinery since identifying spare parts for imported machinery may be time consuming. While the cost of new imported machinery can be arrived at fairly and accurately as mentioned above, caution should be exercised when second hand machinery are proposed to be imported. In such cases, apart from getting quotation for machinery price from the machinery dealers, the price of the machinery should also be assessed by an independent, competent engineer after duly inspecting the machinery. The unexpired future life of second hand machinery is also to be got estimated by the engineer.

Cost of power generator is to be included in the cost of plant and machinery, whenever it is felt essential to have a generator as a stand-by source of power. Apart from main machinery, the requirement of items like laboratory equipments, tool room machinery etc., are also to be carefully assessed and included in the scheme of plant and machinery proposed for the project.

(V) Electricals

The cost of electrical items include the cost of cables, panel boards, voltage stabilizers etc. Whenever the industry is to draw electric power from a high tension power line, necessary voltage step-down transformer should be included in the project and it’s cost should be accounted for.
(VI) Transport and Erection Charges

Transportation charges till the plant and machinery reaches the factory site, including loading and unloading charges are to be accounted for. Erection charge includes machinery foundation cost and machinery assembling and erection expenses.

(VII) Know-how/Consultancy Fees

The following are the expenses that are included under this head.

(a) Know-how fee to technical consultants.
(b) Expenses of training employees in the production process.

(VIII) Miscellaneous Assets

These are the assets that are allied to industrial activity, but that do not form part of plant and machinery. For example, office equipments, furnitures, fire fighting equipments, water coolers, air conditioners etc., come under this category. These assets, though do not form part of industrial equipments, are to be included in the project and adequately provided for in the project cost. Cash deposits with Electricity Boards for getting power connection, advances made to lessor while taking building on lease etc., which are in the nature of refundable deposits are also included under this head.

(IX) Preliminary and Preoperative Expenses

These are miscellaneous expenses that are incurred before the project takes shape and starts commercial production. The following expenses come under this head.

- Investigation fee, service charge etc., to banks/financing institutions.
- Commitment charges payable on loans offered by banks/financial institutions.

(Banks/Financial institutions, after having sanctioned loans for a project, disburse the loan in stages, in proportion to the progress of project implementation. If, for example, the implementation period for a project is say one year, the bank/financial institution that has sanctioned loan to the project should be in a position to release the loan as and when required so that the project implementation is not delayed due to shortage of funds. This being so, the bank/financial institution has to maintain sufficient liquid cash to meet the loan disbursement as and when needed. Since maintaining such cash reserve involves cost, the banks/financial institutions charge a fee called commitment charges).

- Interest on term loans during implementation period.

[The term ‘Term loan’ is nothing but a long term loan given by banks/financial institutions for setting up of projects. Term loans are granted for the acquisition of fixed industrial assets. As mentioned above, the loan is disbursed in stages during the implementation of the project. Banks/financial institutions offer holiday period (technically called as ‘Moratorium’) for the repayment of principal loan amount. The moratorium for the repayment of principal loan amount will depend on the project implementation schedule and is normally fixed in such a way that the first installment of term loan repayment starts after allowing reasonable period beyond the date of commencement of commercial production. However, interest on term loan is payable right from the date of disbursement of term loan. If a project has drawn term loan in stages during a particular period of time, interest on the term loan amount is payable in quarterly or half yearly installments as decided by the financing institution. Since by now the project would be only under implementation stage and would have not]
yet started generating revenue, the project promoter should tie-up necessary sources of funds to meet the interest on term loan during the implementation period. Hence the interest amount payable to the term-loan lending institution during the period of implementation of the project is to be worked out and included in the project cost."

- Mortgage expenses.
- Expenses on capital issues.
- Other miscellaneous expenses during the project implementation stage.
- Insurance charges.

Both fixed assets and current assets (inventory) are to be insured against possible damage by fire accident. Though the project promoters may sometimes consider this as an unwanted expense it can not be viewed so. Any project is started with the plan of reaping benefits over a longer period of time. For the project to survive till its economic life, it is imperative that the assets should be safeguarded by insuring them. Banks and financial institutions insist that the assets financed by them be insured. Normally the insurance premium is paid once in a year. Assets are to be insured as and when they are created. Insurance premium for the fixed assets will be fully paid by the time the fixed assets are created and the project is about to go for production, while the insurance premium on inventory will be paid after this period. Thus, the insurance premium payable on the fixed assets is an expense that is incurred during the project implementation stage and accordingly the same is to be included in preoperative expense.

During the project implementation period, insurance premium is payable on the fixed assets that are being created. This is taken to the head ‘preoperative expenses’. Once the project implementation is completed, insurance premium is payable on the inventory also apart from the insurance premium on the fixed assets created. Hence, from the first year of operation of the plant onwards, insurance premium is payable on the fixed assets as well as on the inventory.

(X) Provision for Contingencies

The cost estimates of land, land development, building, plant and machinery, electricals, transport and erection etc., that are made are based on certain assumptions. While actually implementing the project, it is more likely that there may be deviations between the estimated cost and the actual cost. For example, (a) the price of plant and machinery may rise; the sales tax, excise duty etc., may get revised on the higher side; (b) in the case of imported plant and machinery, the cost in terms of rupee may increase due to adverse fluctuations in foreign exchange rates; (c) during implementation of the project there may be minor deviations required to suit the field conditions—some equipments which were not originally envisaged may be required to be included etc.

In order to meet such unexpected but unavoidable cost increase, there must be a provision in the project cost. This is done by making a contingency provision in the project cost which may vary from 5% to 15% of the cost of non-firm items. A higher contingency provision is required if the implementation period is longer since the chances of increase in cost increases with the passage of time.

(XI) Margin Money for Working Capital

This head which forms part of the project cost needs some explanation. Any project needs funds for two purposes. First, for the setting up of the project and then for maintaining the operation of the plant. The funds required for setting up the project consists of investment on fixed assets while the funds required for maintaining the operations of the plant consists of investment on working capital.
Banks/Financial institutions extend Term loan for investment on fixed assets while financing of working capital requirement is done mainly by banks. In both the type of financing viz., financing of fixed assets and working capital, the financier expects a margin to be brought in by the promoters. The entire requirement is not financed by way of loan. If the total working capital requirement is say ₹ 50.00 lakhs and if the bank that finances the working capital requirement of the project stipulates a promoter's contribution of 25%, the promoters are to bring in ₹ 12.50 lakhs towards their share of working capital and the bank can finance the remaining 75% of the requirement i.e., ₹ 37.50 lakhs. The share of promoter's contribution to be brought in for availing working capital assistance from bank is the margin money for working capital.

For funding fixed investments meant for the project, the financing institutions stipulate a minimum promoter's contribution. The margin money brought in by the promoters towards working capital is also taken into account for arriving at the promoter's contribution required to be brought in for availing term loan. Hence the margin money for working capital is included as a component of the project cost.

The margin money brought in by the promoters to meet the working capital requirement is out of equity capital which is a long-term source and hence it is included in the capital cost of the project.

**Method of arriving at the margin money for working capital:**

\[
\text{Margin money for working capital} = \text{Working capital requirement} - \text{Probable working capital loan that can be obtained from bank.}
\]

Working capital requirement consists of the funds required for maintaining the working capital cycle. A working capital cycle may be depicted as shown in Fig. 4.1.

Funds are locked up in:
- Raw material
- Work in progress
- Finished goods
- Debtors

![Fig. 4.1](image)

**Raw material:** If the raw material is freely available from nearby sources, it need not be stocked heavily. In such situations, it is enough to stock, say a week's requirement of raw material to meet unforeseen, emergency situations. On the other hand, if the raw material is a scarce commodity, it
should be adequately stocked. A stock of, say 2, 3 or more months requirement may be needed depending upon the situation. Further, if raw material is required to be transported from a far off place, the holding period for raw material will be more in order to maintain production even if transportation of raw material is delayed beyond the scheduled time due to any unexpected reasons. Also there may be situations where the raw material is sold only in bulk quantities. This often happens when the raw material is imported from abroad. In such situations, the quantity of raw material to be stocked is the minimum quantity of raw material that can be purchased in one order.

**Work-in-progress:** By the term 'work-in-progress', we mean the 'Goods-in-progress', *i.e.*, the goods that are undergoing the production process. At any point of time, the goods are in different stages of production. Some may be nearing completion and some may have just been introduced in the production line. The cost of goods-in-progress (or work-in-progress) thus lies between the cost of raw material and the cost of finished goods.

We can visualise finished goods as 'value added raw material'. While the value addition is complete for finished-goods, the value addition is incomplete for goods-in-progress. This is because the value addition is underway and goods are in different stages of production.

\[
\text{Cost of work-in-progress} = \text{Cost of raw material} + \text{Expenses} \\
= \text{Cost of raw material} + (\text{Direct expenses} + \text{Overheads})
\]

The work-in-progress (or goods-in-progress) period is ascertained by carefully studying the production process and the time taken by the raw material to get converted into finished product after passing through the different stages of production.

The break-up details of direct expenses and overheads deserve careful consideration. The different components that form part of the cost of production and profitability estimate will be of use in identifying the direct expenses and over heads. A specimen format of cost of production and profitability estimate is furnished for ready reference [Refer Table 4.1].

<table>
<thead>
<tr>
<th>Table 4.1 Cost of production and profitability estimate</th>
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<tbody>
<tr>
<td><strong>Capacity Utilisation</strong></td>
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<tr>
<td>A. Sales realization</td>
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<tr>
<td>B. Cost of production</td>
</tr>
<tr>
<td>Raw material</td>
</tr>
<tr>
<td>Power</td>
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<tr>
<td>Fuel</td>
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<tr>
<td>Consumables</td>
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<tr>
<td>Wages and salaries</td>
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<tr>
<td>Repairs and maintenance</td>
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<tr>
<td>Rent and insurance</td>
</tr>
<tr>
<td>Factory supervision</td>
</tr>
<tr>
<td>Depreciation (As per Companies Act)</td>
</tr>
<tr>
<td>C. Administrative and selling</td>
</tr>
<tr>
<td>Overheads</td>
</tr>
<tr>
<td>Administrative expenses</td>
</tr>
<tr>
<td>Selling expenses</td>
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<tr>
<td>D. Gross profit before</td>
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<tr>
<td>Interest and tax</td>
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<tr>
<td>([A-B-C])</td>
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</tbody>
</table>

(Contd.)
<table>
<thead>
<tr>
<th>E. Financial charges</th>
<th>I year</th>
<th>II year</th>
<th>III year</th>
<th>... ... ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest on term loan</td>
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<td></td>
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<tr>
<td>Interest on working capital loan</td>
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<tr>
<td>F. Profit after Interest</td>
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<td></td>
<td></td>
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<tr>
<td>[D—E]</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>G. Preliminary exp. written-off</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Profit/loss before tax [F—G]</td>
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<td></td>
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<tr>
<td>I. Provision for tax</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. Profit/loss after tax [H—I]</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>K. Less: Dividend</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>L. Retained profit [J—K]</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>M. Add: Depreciation</td>
<td></td>
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<tr>
<td>(as per Companies Act)</td>
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<tr>
<td>N. Add: Preliminary exp.</td>
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<tr>
<td>Written off</td>
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<td></td>
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<tr>
<td>O. Net cash accrual [L + M + N]</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

The following components (Refer Production and Profitability Estimate for easy identification) form part of Direct Expenses. *

- Power.
- Fuel.
- Wages and Salaries.
- Repairs and Maintenance.
- Factory supervision.

The following components form part of the overheads.

- Administration expenses.
- Selling expenses (includes advertisement expenses also).

Out of the overheads, it is enough if only administrative expenses are taken into account for arriving at the cost of work-in-progress.

**Stock of finished goods:** This component of working capital refers to the cost of goods produced and stored in the godown, before being dispatched to the customers. This turn upon the demand-pattern. Even if a product has a high demand, some finished stock will be usually maintained to meet orders from unexpected/new customers, to provide samples to new customers, to meet unexpected and sudden increase in quantity demanded by existing customers etc.

Cost of stock of finished goods = Cost of raw material and consumables + Expenses

= Cost of raw material + (Direct expenses + Overheads)

Both administrative expenses and selling expenses can be taken into account for arriving the overheads. Though selling expenses in strict sense arises only by the time the goods are sold, the company will be incurring some selling expenses like advertisement and promotion expenses etc., even while the finished goods are in stock but no sale has taken place yet. Hence if selling expenses are also included, we only err on the safer side.

**Sales bills (or book debts):** Certain products can be sold on cash and carry basis. If so, there won’t be any sales-bills outstanding i.e., there will be virtually no book debts. On the other hand, if

*Please note that depreciation is not taken into account as this is a non-cash expenditure item.*
as per the prevailing customs and practice, goods are sold on credit for some period, the same should be taken into account for working capital assessment. A period of say, one month provided for book debts means that goods produced would be sold to customers on credit and the sale proceeds would be paid by the customers to the seller after a period of one month. Till such time the sale proceeds are received back, the plant cannot be kept idle for want of working capital. The operations of the plant will continue without break if there are working capital funds available to offer one month credit to the customers.

Book debts are calculated either on the basis of

(a) Cost of raw material + Expenses (as in the case of finished goods) or on the basis of

(b) Sales price:

While the first method indicates the actual funds required, the second method includes profit also. Of the two methods, the first method (viz., Books debts = Cost of raw material + expenses) is more accurate since ‘Profit’ does not form part of funds requirement in strict sense.

**Creditors for raw materials and consumables (suppliers credit)**: Just as produced goods are sold on credit to the customers, raw materials and consumables can be purchased on credit from the sellers. The credit period available for raw materials and consumables is to be assessed by keeping in view the practice prevailing in the industry. Obviously, the availability of credit facilities from the suppliers of raw materials and consumables reduces the working capital requirement to that extent. Suppliers credit is calculated on the basis of raw material/consumable costs.

Thus the components of working capital requirement may be summarised as under.

<table>
<thead>
<tr>
<th>Component</th>
<th>Period of requirement</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Raw materials and consumables</td>
<td>_______ month*</td>
<td></td>
</tr>
<tr>
<td>(b) Work-in-progress</td>
<td>_______ months**</td>
<td></td>
</tr>
<tr>
<td>(c) Finished goods</td>
<td>_______ months***</td>
<td></td>
</tr>
<tr>
<td>(d) Book debts (or debtors or sales bills)</td>
<td>_______ months****</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Less:

Supplier’s credit available for raw materials and consumables _______ months*****

Working capital requirement

[The period of requirement for each of the above components of working capital is to be carefully arrived at by studying the prevailing industrial/market trend.]

After having arrived at the working capital requirement, the next step is to arrive at the working capital margin. It is the working capital margin that forms part of the capital cost of the project.

* Period for which raw materials/consumables are to remain in stock.
** Time taken by raw material to get converted into finished product.
*** Period for which finished goods are to be stocked.
**** Credit period allowed to debtors.
***** Credit period allowed by suppliers of raw materials/consumables.
Working capital margin = Working capital requirement – Probable working capital finance that can be arranged.

For working capital finance, companies normally approach commercial banks. Hence, it is essential to know the approach generally followed by banks for arriving at the component of working capital finance for a given project. Let us devote some time to understand some of the norms followed by commercial banks in assessing the working capital requirement and working capital finance for projects.

**Tandon committee recommendations:** In the year 1974, Reserve Bank of India appointed a study group named “Study Group for framing guideline for the follow up of Bank Credit” under the Chairmanship of P.L. Tandon, who was the Chairman of Punjab National Bank. RBI accepted the major recommendations made by the committee and advised the banks to implement the recommendations accepted by the RBI.

The major areas of recommendation covered by the Tandon Committee are as under:

(a) Stipulation of norms for holding of inventory and for receivables.
(b) Style of bank credit towards working capital.
(c) Maximum possible bank finance towards working capital.
(d) Follow-up and supervision of bank credit.

The Committee prescribed norms for 15 selected industries and these 15 industries together accounted for about 50% of the total industrial bank credit. Though the committee suggested norms only for 15 selected industries it suggested to the RBI to make regular review of the norms and to make necessary changes that are deemed necessary and also suggested to include other industries. RBI has been accordingly revising the norms based on the requirement.

Out of the recommendations of the Tandon Committee, the areas most relevant to the determination of working capital finance/working capital margin is the “Maximum Permissible Bank Finance”.

Tandon Committee suggested three different methods of arriving at the Maximum Permissible Bank Finance, which are reproduced below:

<table>
<thead>
<tr>
<th>First method</th>
<th>Second method</th>
<th>Third method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total current assets</td>
<td>Total current assets</td>
<td>Total current assets</td>
</tr>
<tr>
<td>Less: Current Liabilities other than Bank borrowings</td>
<td>Less: 25% of the total current assets (to be met out of long term sources)</td>
<td>Less: Core current assets (to be financed from long term sources)</td>
</tr>
<tr>
<td>Working capital gap</td>
<td>Less: Current Liabilities other than bank borrowings</td>
<td>Real current assets</td>
</tr>
<tr>
<td>Less: 25% of Working capital gap (to be met out of long term sources)</td>
<td></td>
<td>Less: 25% of real current assets</td>
</tr>
<tr>
<td>Maximum Permissible Bank Finance</td>
<td>Maximum Permissible Bank Finance</td>
<td>Maximum Permissible Bank Finance</td>
</tr>
</tbody>
</table>
One of the recommendations of ‘Chore Committee’ (a committee appointed by the RBI in the year 1979 to suggest further guidelines to fine-tune the working capital financing pattern) is that all the borrowers enjoying working capital credit limit of ₹ 50.00 lakhs and above will have to bring gradually additional contribution based on the second method of lending as prescribed by the Tandon committee.

Accordingly, Method-I is adopted for projects with working capital limits of ₹ 10.00 lakhs and above, but less than ₹ 50.00 lakhs.

Method-II is adopted for projects where the total working capital limit is ₹ 50.00 lakhs and above.

Method-III deals with a component known as ‘Core Current Assets’. This represents the minimum level of current assets that a company should hold during course of operations and it varies from one company to another. This method requires higher proportion of working capital requirement to be funded by long term resources and hence the maximum permissible bank finance will be less under this method, as compared to the other two methods. Fig. 4.2 indicates the composition of fixed assets and current assets of a company.

Method-III is applicable only for companies that are in operation for some time and whose operations have stabilized.

Hence, only the first two methods are relevant for arriving at the working capital margin for new projects. (Though norms have been prescribed by Tandon Committee, they are not rigid and deviations from the prescribed norms are allowed if the situations warrant and if the bankers are convinced).

**RBI directives to banks for lending working capital assistance:** Since the Government has taken to the option of economic liberalisation, consistent with the Government’s Policy, the RBI, in the year 1997, had withdrawn the prescription given to banks regarding assessment of working capital requirements/finance based on the Tandon Committee recommendations and the banks have been given optional freedom to decide upon the quantum of working capital finance based on their assessment of the borrowers and their credit requirements. After the dissolution of Tandon committee guidelines, State Bank of India has come out with some guidelines for arriving at the working capital finance limits to borrowers. However, most banks are still either following the Tandon
Committee Guidelines or are using the Tandon Committee guidelines as a reference to recheck their assessment in case they follow some other techniques.

For our purpose of arriving at the working capital margin we can follow Method-I of Tandon committee guidelines if the working capital credit limit is less than ₹ 50.00 lakhs and Method-II if the working capital credit limit is ₹ 50.00 lakhs and above.

**General remarks on project cost:** The project cost is arrived at by adding the estimated cost of the individual components as explained above. It is always worthwhile to have the project cost cross checked with industry standards. This will help in identifying major deviations, if any. For example, the cost of setting up a cotton yarn-spinning mill can be arrived at in terms of cost per spindle. The cost per spindle serves as a reference since this can be compared with other similar projects.

The cost of setting up a cement plant may be reduced to the cost per tonne of installed capacity. Such yard sticks of cost per unit of output serve as reference, especially to banks/financial institutions who can compare the unit cost of similar projects that they appraise for extending term loans.

It may be noted that such yard sticks only act as thumb rules and one should not get carried away by this. If the industry yard stick is ₹ 10,000/- per unit of output, and if a project that is being appraised has a project cost of ₹ 8,000/- per unit of output, the project cost is prima-facie less and hence it is likely that the project's profitability would be good. However, this is only an indicator and not the final word. The profitability and viability of the project can be ascertained only by carrying out a detailed study.

**Illustration 4.1**

M/s Excellent Industries Pvt. Ltd., a newly incorporated company has proposed to set up a plant for the manufacture of plastic moulded chairs. The following are the details of the proposed project.

(a) The company has entered into an agreement for the purchase of 2.00 acres of land for the project at the rate of ₹ 2.00 lakhs per acre.

(b) The company has proposed to import the plastic injection moulding machine (which is the main machine used for the manufacture of moulded chairs), and the c.i.f. value of the machine is ₹ 80.00 lakhs. Import duty on c.i.f. value is 30%. The injection moulding machine is capable of producing moulded chairs at the rate of one chair per minute. Though the machine can be used for the manufacture of chairs of different sizes, the company has proposed to concentrate only on the manufacture of chairs of normal size, which has got good market. The average weight of normal sized chair is 2.50 kg.

(c) The company proposes to acquire the following machinery indigenously.

(i) Scrap Grinder (at a price of ₹ 5.00 lakhs).

(ii) Mixing machine (at a price of ₹ 4.00 lakhs).

(iii) Power Generator (at a price of ₹ 35.00 lakhs).

(d) The cost of electric motors, starter, switches, cables and other electrical items is ₹ 7.00 lakhs.

(e) The cost of dies required for the plant is estimated at ₹ 30.00 lakhs.

(f) The company has proposed to construct the following buildings.

(i) Main factory building with Asbestos Corrugated Cement Sheet (A.C.C.) roofing over steel trusses—with a built-up area of about 375 square metres.

(ii) Store room (for the storage of raw material and for the storage of finished products), with Asbestos Corrugated Cement Sheet (A.C.C.) roofing over steel trusses—with a built-up area of about 95 square meters.
(iii) Office and administrative blocks with Reinforced Cement Concrete (R.C.C.) roofing—with a built-up area of about 70 square meters.

(iv) Other amenities like Toilet block, compound wall, gate, underground water tank to suit the requirements.

(g) The raw material required for the project is polypropylene granules, which is costing around ₹ 60/- per kg. The wastage of raw material during the manufacturing process is estimated at about 3%.

(h) The total power requirement (connected load) is estimated at 200 H.P.

(i) The selling price of moulded chair is around ₹ 350/- per chair in the retail market. The company has tied up a selling price of ₹ 280/- per chair with a network of dealers across the country.

Estimate the cost of the project. Make suitable assumptions wherever necessary.

Solution:

For arriving at the project cost, each component of the project cost is to be taken up separately and assessed.

(a) Land:

- Extent of land proposed: 2.00 acres
- Cost of land (at the agreed price of ₹ 2.00 lakhs per acre): ₹ 4.00 lakhs
- Add: Registration charges at 13% of the Consideration (13% of ₹ 4.00 lakhs): ₹ 0.52 lakhs
  - Total: ₹ 4.52 lakhs

(b) Land development charges: It has not been indicated that the land needs any developmental work. Hence no provision is made.

(c) Building:

(i) Main factory building:

- Built up area: 375 sq.m.
- Cost of construction at the rate of ₹ 3,750/- per sq.m. (estimated cost per sq.m. of construction is to be arrived at based on either detailed estimate or by making an assessment of the prevailing construction cost of similar constructions).

\[
\text{Cost} = 375 \times 3,750 = ₹ 14,06,250
\]

- Say ₹ 14.06 lakhs (A)

(ii) Store room:

- Built-up area: 95 sq.m.
- Cost of construction at the rate of ₹ 3,750/- per sq.m.

\[
\text{Cost} = 95 \times 3,750 = ₹ 3,56,250
\]

- Say ₹ 3.56 lakhs (B)
(iii) Office and Administrative Blocks:

Built-up area : 70 sq.m.

Cost of construction at the rate of ₹ 5,300/- per sq.m.

\[ 70 \times 5,300 = ₹ 3,17,000/- \]

Say ₹ 3.17 lakhs \( (C) \)

(iv) Other amenities:

- Toilet block (Lumpsum) : ₹ 1.50 lakhs
- Compound wall (Lumpsum) : ₹ 3.00 lakhs
- Gate (Lumpsum) : ₹ 0.50 lakhs
- Underground water tank (Lumpsum) : ₹ 1.25 lakhs

\[ ₹ 6.25 \text{ lakhs} \] \( (D) \)

[Note: The cost of construction of amenities can be obtained by getting detailed estimates from a qualified civil engineer. Under this head, the actual requirement of amenities should be studied carefully, because this is an area where there is likelihood of underestimation due to not envisaging all the amenities required for the project. For example, if water is required for the manufacturing process and if water supply is to be made available at different points in the production line, this will necessitate construction of an overhead water tank. The capacity of overhead water tank is to be ascertained based on the storage capacity required.]

Other amenities that may be required include, loading/unloading platforms, canteen, restroom for workers, power distribution room, etc. The actual requirement is to be arrived at after giving a thought over the needs of the project.]

Total investment required for building \((A + B + C + D)\) : ₹ 27.58 lakhs

(d) Plant and machinery:

(i) Imported machinery

- c.i.f. value : ₹ 80.00 lakhs
- Customs duty at 30% : ₹ 24.00 lakhs
- * Clearing charges : ₹ 0.50 lakhs

\[ ₹ 104.50 \text{ lakhs} \]

(*Clearing charges are the charges payable to the clearing agents for their services rendered in clearing the goods from the port and this may be in the range of \( \frac{1}{2}\% \) to 1%).

(ii) Indigenous machinery:

- Scrap grinder : ₹ 5.00 lakhs
- Mixing machine : ₹ 4.00 lakhs
- Power generator : ₹ 35.00 lakhs
- Dies* : ₹ 30.00 lakhs

\[ ₹ 74.00 \text{ lakhs} \]

Total investment on plant and machinery

\[ (₹ 140.50 \text{ lakhs} + ₹ 74.00 \text{ lakhs}) : ₹ 178.50 \text{ lakhs} \]

[*The project is for the manufacture of plastic moulded chairs of normal size. Such projects require dies of different designs to suit the taste of the customers. How much is to be invested for
dies is a crucial decision. If the plant has say 100 dies of different designs, it means that the plant can produce chairs of 100 different models, which means that the company will have an edge over its competitors in view of the product variety that it can offer. However, if the investment on dies becomes exorbitant, it would even affect the viability of the project proposition. Dies are in general costly items and hence a proper balance should be struck in arriving at the actual requirement. Too many dies means too much investment and most of the dies will remain idle since only one die will be used in the machine at a time. On the other hand, if only a very few dies chosen, the product may lack variety and the product may find it difficult to penetrate through the market.

In the given problem, no mention has been made about the number of dies proposed, but only the total investment proposed for dies has been given as ₹ 30.00 lakhs. Let us presume that the optimum requirement of dies has been correctly assessed and provided for.]

(c) **Transport and erection charges**: Expenditure under this head is to be estimated by studying the real situation. The main machine is proposed to be imported. Hence this machine is to be carried to the factory site from the nearest port.

Indigenous machines are to be lifted from the supplier’s site to the factory site. The transportation expense depends on the weight and volume of the machinery and the distance to be covered. Apart from transportation charges, loading and unloading expenses are also to be accounted for under this head. Freight carriers will be in a position to indicate the approximate amount that may be required for transporting the machinery to the factory site.

Erection charges depend upon the nature of the machine. Heavy machines and machines that generate strong vibrations need special machine foundations. The opinion of structural engineers may be used in arriving at the likely erection charges. The machinery suppliers themselves will be in a position to indicate this amount, since, after all, they are the people who know the ground realities in view of their constant exposure to such situations.

Let us assume that the transport and erection charges has been arrived at ₹ 8.00 lakhs after giving due consideration to the factors explained above.

(f) **Electrical**:

Electric motors, starters, switches, cables  
and other electrical items  : ₹ 7.00 lakhs

*Note:* In respect of projects that use high tension electric power, the State Electricity Board authorities insist that the consumers have to install their own ‘Step-down electric transformer’ which is meant for reducing the high voltage of the incoming electric current to a low voltage meant for actual consumption. There may be also instances where the promoters have to meet expenses for bringing electric power line from nearby locations (like cost of cables, cost of poles etc.). These aspects are to be carefully studied.

(g) **Contingency**: Contingency provision is made to take care of probable increase in cost due to new additions and/or due to escalation in prices. The provision allowed ranges from 5% to 15% and it is allowed on the following heads.

- Land.
- Land development expenses.
- Building.
- Plant and machinery.
- Transport and erection.
- Electricals.
- Technical know-how fee.
- Miscellaneous assets.

For other heads in the project cost, contingency provision is not normally made. The above elements of the project cost can be grouped under two categories viz., firm items and non-firm items. Firm items are those elements whose cost are more or less fixed and are not likely to increase and hence do not require any contingency provision. Other elements whose cost are likely to fluctuate and hence require contingency provision are called non-firm items. For example, if an agreement has already been entered into for the purchase of the required extent of land at a certain price, within a certain period, the investment required to be made towards the purchase of land is tied up, provided purchase of land is not delayed beyond the agreed date. This cost of land is a firm cost and hence does not need any provision of contingency.

Among other items, it is the normal practice to provide a contingency provision of about 5% on the cost of building and about 10% on the cost of plant and machinery and electricals. However, this is not a hard and fast rule and the judgement of the appraiser plays an important rule in arriving at the appropriate contingency provision. If the project involves imported machinery, there is a higher element of cost fluctuation in view of likely fluctuations in foreign exchange rate, and likely change in import duty, apart from increase in machinery price.

In the given problem, the company has already entered into an agreement for the purchase of land. Hence it can be assumed that the land cost is tied up (i.e., it is not likely to increase).

We can provide 5% contingency on building and say 10% on plant and machinery (indigenous) electricals, transport and erection and say 15% on plant and machinery (imported). It is assumed that the cost of miscellaneous assets is firmed up and does not require any contingency provision.

Thus, the required contingency is,

\[
5\% \ (27.58) + 10\% \ (74.00 + 7.00 + 8.00) + 15\% \ (104.50) \\
= \text{₹} \ 1.374 + 8.900 + 15.675 \\
= \text{₹} \ 25.954 \\
= \text{Say ₹} \ 26.00 \text{ lakhs}
\]

(h) Miscellaneous fixed assets: The given data does not contain any information on the investment towards this head. The following assumptions are made:

<table>
<thead>
<tr>
<th>Miscellaneous assets</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office furnitures</td>
<td>₹ 1.25 lakhs</td>
</tr>
<tr>
<td>Office equipments</td>
<td>₹ 1.40 lakhs</td>
</tr>
<tr>
<td>Deposit to electricity board</td>
<td>₹ 0.75 lakhs</td>
</tr>
<tr>
<td></td>
<td>₹ 3.40 lakhs</td>
</tr>
</tbody>
</table>

(i) Preliminary and preoperative expenses: The following assumptions are made:

(i) Service charge on term loan : 0.75%
(ii) Commitment charges on term loan : 1.00%
(iii) Rate of interest on term loan : 15% per annum
(iv) Project implementation period : 11 months
(v) Insurance premium on fixed assets : 0.75% per annum
(ii) Insurance premium on fixed assets: 0.75% per annum

The outlay required to meet items (i), (iii), and (iii) depends upon the term loan amount. We have not yet arrived at the term loan component. The value of fixed assets assessed so far is given below:

[₹ in lakhs]

Land 4.52
Land development —
Building 27.58

Plant and machinery
(a) Imported 104.50
(b) Indigenous 74.00
Transport and erection 8.00
Electricals 7.00
Contingency 26.00

251.60

The term loan component is not known at present.
The following is assumed.

Term loan component (at 80% of fixed assets)
(i.e., 0.80 × 251.60) = ₹ 201.28 lakhs

Say = ₹ 200.00 lakhs

Interest during implementation period (for a term loan of ₹ 200.00 lakhs)

\[
\frac{15}{100} \times \frac{11}{12} \times 200 \times \frac{1}{2} = ₹ 13.75 \text{ lakhs}
\]

Commitment charges at 1.00% of loan amount = ₹ 2.00 lakhs
Service charge at 0.75% of loan amount = ₹ 1.50 lakhs
Insurance premium on fixed assets @ 0.75% per annum
[0.75/100 × 27.58 + 178.50 + 7.00 + 8.00 + 26.00] = ₹ 1.85 lakhs
Other startup expenses (Say) = ₹ 0.90 lakhs

= ₹ 20.00 lakhs

* The loan component assumed is only a rough estimate and if the loan component arrived at after tying up the means of finance differs from this assumed figure by a larger extent, the figures of preliminary expenses are to be reworked.
** It is assumed that the loan amount of ₹ 200.00 lakhs is drawn during the implementation period of 11 months at a uniform phase and hence the interest is arrived at by multiplying simple interest for 11 months by 1/2.
*** Transport and erection charges for machinery are also included for arriving at the insurance charges. The entire contingency provision of ₹ 26.00 lakhs is also included on the assumption that the entire contingency will be used.

(i) Working capital margin: Before arriving the working capital margin, which is the last component of the project cost, the working capital requirement for the first year of operation is required to
be arrived at. From the working capital requirement, if the likely working capital loan component is deducted the balance represents the working capital margin. For arriving at the working capital requirement/margin, usually, the data relevant to the first year of operation are taken into account. Let us assume the capacity utilisation as under:

<table>
<thead>
<tr>
<th>Year</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>VI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50%</td>
<td>60%</td>
<td>70%</td>
<td>80%</td>
<td>80%</td>
<td>80%</td>
</tr>
</tbody>
</table>

The working capital requirement/margin is to be arrived at for the first year of operation viz., for 50% capacity utilisation.

The format for arriving at the working capital margin/working capital finance is as under:

**Total current assets**

**Less:** 25% of the total current assets (to be met out of long term sources)

**Less:** Current liabilities other than bank borrowings

**Maximum permissible bank finance**

Thus, as per the above method, the working capital margin is nothing but 25% of the total current assets. The different current assets/current liabilities and their period of requirement (assumed) are as under.

**Current Assets:**

- Raw material and consumables — 1 month
- Goods in progress — 2 days
- Stock of finished goods — 1 month
- Debtors — 2 months

**Current Liabilities:**

- Supplier's credit for raw materials and consumables — 1 month
  
  Let us calculate the total current assets using the above data.

**Raw material and consumables:**

The raw material used for the production is 'polypropylene' and there are virtually no 'consumables' and hence 'consumables' is ignored.

* Capacity utilisation in the initial years is less due to the following reasons:
  - Workers need time to get trained in the machine.
  - Some machines normally require to be operated at a slower speed than the designed speed for some time.
  - The product is at the beginning stage and capturing market share will take some time.
Average weight of one chair : 2.50 kg.
Quantity of raw material required for one chair, taking into account wastage of 3% : 2.50 × 1.03
= 2.575 kg.
Output per day (for 3 shifts) = 1,440 chairs
Output per day for the first year of operation (at 50% capacity) = 720 chairs
Output per month (assuming 25 working days per month)[720 × 25] = 18,000 chairs
Raw material requirement for one month (18,000 × 2.575) = 46,350 kg
Cost of stock of one month requirement of raw material at the rate of ₹ 60/- per Kg. :
(46,350 × 60) ₹ 27,81,000/-
i.e., ₹ 27.81 lakhs

Expenses:

(a) Direct expenses:

(i) Power:

Power charge : ₹ 3.50 per unit (assumption)
Connected power : 200 H.P.
= 149.20 kilowatt
(1 HP = 0.746 kilowatt)
Power consumption per month at the rate of 24 hours of working per day and for 25 working days per month = 149.20 × 24 × 25
= 89,520 units.
[1 kilowatt-hour = 1 unit i.e., if one kilowatt of power is used for a period of one hour, the power consumption is one unit].
Power consumption per month for the first year of operation at 50% capacity utilisation (0.50 × 89,520) = 44,760 units.
Power charges per month for the first year of operation at the rate of ₹ 3.50 per unit (44,760 × 3.50) ₹ 1,56,660/-
Say ₹ 1.57 lakhs

(ii) Fuel:

Certain industries may need fire-wood, coal, furnace oil etc., in their production process. In the given project, the production process requires only electric power and hence no provision is made under this head. Though power generator envisaged in the project will consume diesel which can be
provided for under this head, since frequent electric power cut/shortage is not envisaged, provision for fuel is not made.

(iii) Wages and salaries:

The following personnel and wages/salaries are assumed for the first year of operation.

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Salary per person per month [₹]</th>
<th>Total salary per month [₹]</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Manager—1 person</td>
<td>20,000/-</td>
<td>20,000/-</td>
</tr>
<tr>
<td>Production incharge—6 persons</td>
<td>15,000/-</td>
<td>90,000/-</td>
</tr>
<tr>
<td>(at the rate of 2 persons per shift)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled technicians—12 persons</td>
<td>9,500/-</td>
<td>1,14,000/-</td>
</tr>
<tr>
<td>(at the rate of 2 persons per shift)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi skilled persons—15 persons</td>
<td>5,000/-</td>
<td>75,000/-</td>
</tr>
<tr>
<td>(at the rate of 5 persons per shift)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unskilled workers—18 persons</td>
<td>4,000/-</td>
<td>72,000/-</td>
</tr>
<tr>
<td>(at the rate of 6 persons per shift)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wages for persons who are not regularly employed (Lumpsum)</td>
<td></td>
<td>10,000/-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3,81,000/-</td>
</tr>
</tbody>
</table>

= ₹ 3.81 lakhs

(iv) Repairs and maintenance:

The following assumptions are made for the first year of operation.

(a) Repairs and maintenance charges for building for the first year of operation = 0.5% of the cost.

(b) Repairs and maintenance charges for plant and machinery for the first year of operation = 4% of the cost.

Hence, Repairs and maintenance charges per month for both building and plant and machinery

\[
= \frac{1}{12}[(0.5/100 \times 27.58) + (4/100 \times 178.50)]
\]

= ₹ 0.61 lakh

(v) Rent, Insurance:

'Rent' does not apply since the project is not set up in leasehold premises. Insurance consists of insurance on fixed assets as well as insurance on inventories. [Note: Insurance premium on fixed assets was already included in the pre-operative expenses. This is the insurance premium paid on the fixed assets for the period of implementation]. Once the project implementation is over, both the fixed assets and the inventories need to be insured.

As far as insurance premium on Fixed assets is concerned, only the premium for industrial assets are included under this head. Thus the insurance premium payable on office/administrative buildings are excluded. [These are considered under the head Administrative overheads].
Total estimated cost of building: ₹ 27.48 lakhs

Less: Cost of office and administration block and
Other amenities [3.71 + 6.25]: ₹ 9.96 lakhs

Estimated cost of industrial building: ₹ 17.52 lakhs

Out of the total contingency provision of Rs 26.00 lakhs, the proportionate contingency for office and administrative buildings and other amenities is to be excluded.

Total contingency: ₹ 26.00 lakhs/annum.

Less: Contingency on office and administrative
Building and other amenities at 5% [5/100 × 9.96]: ₹ 0.50 lakhs/annum

Contingency allowed for industrial assets: ₹ 25.50 lakhs/annum

Insurance premium on industrial assets at the rate of 0.75% [assumption]

\[
= \frac{0.75}{100} \times (17.52 + 104.50 + 74.00 + 8.00 + 7.00 + 25.50)
\]

= ₹ 1.77 lakhs per annum.

i.e., = ₹ 0.15 per month

(vi) Factory supervision:

The following are assumed for the first year of operation

<table>
<thead>
<tr>
<th>Personnel</th>
<th>Salary per person</th>
<th>Total salary per month [₹]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory supervisors—3 Nos. (at the rate of one person per shift)</td>
<td>12,000/-</td>
<td>36,000/-</td>
</tr>
</tbody>
</table>

i.e., ₹ 0.36 lakh

Total direct expenses \((1.57 + 0.00 + 3.81 + 0.61 + 0.15 + 0.36) = ₹ 6.50 lakhs\)

(b) Overheads:

(i) Administrative overheads:

The following are assumed:

Salary to administrative staff per month: ₹ 0.46 lakh
Director’s fee, audit fee per month: ₹ 0.20 lakh

Insurance premium on office and administrative
Buildings and miscellaneous office assets at the rate of 0.75% p.a. on building and 1.00% p.a. on miscellaneous office assets

\((a) \ 0.75/100 \times (9.96 + 0.50*) + 1/100 \times (1.25 + 1.40)\)

= ₹ 0.105 lakhs p.a.

i.e., Say: ₹ 0.01 lakh per month

(b) Insurance premium for inventory: ₹ 0.03 lakh per month (assumption)

= ₹ 0.70 lakh per month

*0.50 lakh represents proportionate contingency for office and administrative buildings.
(ii) Selling overheads:

The following assumptions are made.

Packing expenses $= 0.50\%$ of sales turnover (assumption)
Selling and advertisement expenses $= 2.00\%$ of sales turnover (assumption)

Total $= 2.50\%$

Sales turnover per month for the first year of operation at 50% capacity and for 25 working days in a month:

$= \text{₹} \ 50,40,000/- (25 \times 720 \times 280)$

$i.e., \ \text{₹} \ 50.40 \text{ lakhs}$

Selling overheads per month at 2.50\% of sales turnover:

$= \text{₹} \ 1.26 \text{ lakhs}$

Total overheads per month (0.70 + 1.26):

$= \text{₹} \ 1.96 \text{ lakhs}$

Goods in progress:

Cost of goods-in-progress for 2 days $= \text{Cost of raw materials for 2 days} + \text{Expenses for 2 days}$

$= 2/25 \ (27.81) + 2/30 \ (6.50 + 0.70)\ast$

$= 2.22 + 0.48$

$= \text{₹} \ 2.70 \text{ lakhs}$

Stock of finished goods:

Cost of stock of finished goods $= \text{Cost of raw material} + \text{Expenses}$

Cost of stock of finished goods per month $= \text{Cost of raw materials per month} + \text{Expenses per month}$

$= 27.81 + (6.50 + 1.96)$

$= 27.81 + 8.43$

$= \text{₹} \ 36.24 \text{ lakhs}$

Debtors:

(Note: Profit component is excluded for the computation of sales bills)

Sales bills per month $= \text{Cost of raw material per month} + \text{Expenses per month}$

$= 27.81 + (6.50 + 1.96)$

$= 27.81 + 8.43$

$= \text{₹} \ 36.24 \text{ lakhs}$

Sales bills for 2 months $= \text{₹} \ 72.48 \text{ lakhs}$

\ast Raw material requirement for 2 days is arrived at by considering the monthly requirement as the requirement for 25 working days. However monthly expenses are considered to be the expenses for 30 days.
**Total Current Assets:**

Raw material and consumables – 1 month – ₹ 27.81 lakhs
Goods-in-progress – 2 days – ₹ 2.70 lakhs
Stock of finished goods – 1 month – ₹ 36.24 lakhs
Debtors – 2 months – ₹ 72.48 lakhs

-working-capital-margin-at-25%-of-
total-current-assets-(0.25 \times 139.23) = ₹ 34.81 lakhs
Say = ₹ 35.00 lakhs

**Note:** Maximum Permissible Bank Finance for working capital is not required for the computation of capital cost of the project. However, the same is worked out below to give an exposure.

Total current assets — ₹ 139.23 lakhs
Less: 25% of the total current assets — ₹ 34.81 lakhs
  ____
  ₹ 104.42 lakhs
Less: Current liability other, than bank borrowings (suppliers credit of one month for raw material is assumed) — ₹ 27.81 lakhs
Maximum Permissible Bank Finance — ₹ 76.61 lakhs

Since all the components of project cost have been arrived at, it can be summarised as under.

**Project cost**

(a) Land — 4.52
(b) Land development — —
(c) Building — 27.58
(d) Plant and machinery
  • Imported — 104.50
  • Indigenous — 74.00
(e) Transport and erection — 8.00
(f) Electricals — 7.00
(g) Contingency — 26.00
(h) Miscellaneous assets — 3.40
(i) Preliminary and Pre-operative expenses — 20.00
(j) Working capital margin — 35.00

**Project cost**

[ ₹ in lakhs]

310.00

**Note:** The method of arriving at the working capital margin as explained in illustration 4.1 above, is a fairly accurate method. But, we know that however accurate our assessments are, it is all based on certain assumptions and the assumptions may go wrong. To take care of any underestimation in the costs of fixed assets, we have included a head called ‘Contingency’ in the project cost estimate. How about contingency for working capital assessment?

Financial institutions adopt the following format for the assessment of working capital requirement/working capital margin.
(i) Raw material - - - month’s requirements: ₹ - - -
(ii) Stock-in-progress - - - week’s/month’s requirements: ₹ - - -
(iii) Finished goods - - - month’s requirements: ₹ - - -
(iv) Sundry debtors - - - month’s requirements: ₹ - - -
(v) Working expenses - - - month’s requirements: ₹ - - -
Total for (i) + (ii) + (iii) + (iv) + (v) : ₹ - - -
(vi) Less: Credit available for raw materials - - - month’s requirements: ₹ - - -
(vii) Less: Advance payment on order received: ₹ - - -
(viii) Working capital required \([(i) + (ii) + (iii) + (iv) + (v) - (vi) - (vii)]
(ix) Less: Probable Bank Loan for working capital: ₹ - - -
(x) Working capital margin: ₹ - - -

In the above format, item – (v) viz., working expenses deserves consideration. It represents the manufacturing and administrative expenses. A question might be raised as to why expenses should be included separately while the expenses likely to be incurred have already been taken into account at every stage viz., in items (ii), (iii) and (iv) above. It is customary to provide for one month’s working expenses (both direct and indirect expenses) as a cushion to take care of any underestimation in the working capital assessment and to take care of any bottlenecks that may prop in while production process is on. In a way this additional provision acts like a contingency provision for working capital assessment. If the operation cycle is very long (say more than a year) the provision for working expenses may have to be increased (to say, two or three months) to take care of contingencies.

Illustration 4.2

M/s. A.B.C. Industries, a registered partnership firm proposes to set up a new industrial unit for undertaking machining job works. The firm proposes to set up the unit in a rented premises. There are firm orders in hand from reputed customers. The customers will supply components to be machined (i.e., Raw material) and take back machined components, paying the charges quoted by the firm. The firm proposes to purchase an indigenous CNC milling machine for the purpose. The other relevant details about the project are as under:

- Monthly lease rent payable for the factory premises : ₹ 8,000/-
- Cost of machine (including taxes), including electricals: ₹ 25,22,000/-
- Transport and erection charges (estimated): ₹ 1,05,000/-
- Miscellaneous assets proposed to be purchased: ₹ 19,000/-
- Advance payable to lessor of the premises: ₹ 80,000/-
- Electricity power charges per month (estimated): ₹ 6,750/-
- Wages and salaries per month (estimated): ₹ 55,000/-
- Administrative and other overhead expenses per month (estimated): ₹ 9,000/-
- Insurance premium for machine: 0.6%

The customers are not expected to make any advance payment, but are expected to pay the charges quoted for executing orders immediately after receiving the finished products. The partners
of the firm have decided to invest their own capital for both meeting the fixed cost of the project and for meeting the working capital requirements of the project.

Estimate the capital cost of the project. Make suitable assumptions wherever required.

Solution:

Let us reproduce the components of project cost for the sake of easy reference.

<table>
<thead>
<tr>
<th>Project cost</th>
<th>[₹ in lakhs]</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Land</td>
<td>—</td>
</tr>
<tr>
<td>(b) Land development</td>
<td>—</td>
</tr>
<tr>
<td>(c) Buildings</td>
<td>—</td>
</tr>
<tr>
<td>(d) Plant and machinery</td>
<td>—</td>
</tr>
<tr>
<td>(e) Electrical</td>
<td>—</td>
</tr>
<tr>
<td>(f) Transport and erection charges</td>
<td>—</td>
</tr>
<tr>
<td>(g) Contingency</td>
<td>—</td>
</tr>
<tr>
<td>(h) Know-how/consultancy charges</td>
<td>—</td>
</tr>
<tr>
<td>(i) Miscellaneous assets</td>
<td>—</td>
</tr>
<tr>
<td>(j) Preliminary and Pre-operative expenses</td>
<td>—</td>
</tr>
<tr>
<td>(k) Working capital margin</td>
<td>—</td>
</tr>
</tbody>
</table>

Most of the required data are given straight away in the problem.

(a) Land : Not applicable; There is no fixed investment required under this head as the unit is proposed to be located in a rented premises.
(b) Land development : —
(c) Buildings:
(d) Plant and machinery including electricals : ₹ 25.22 lakhs (from the given data).
(e) Electrical : ₹ Nil (since electricals are stated to be included in plant and machinery).
(f) Transport and erection : ₹ 1.05 lakhs (from the given data).
(g) Contingency (assuming a provision of 10% on plant and Machinery Transport and erection) : ₹ 2.63 lakhs
(h) Know-how/Consultancy charges : ₹ Nil
(i) Miscellaneous assets : ₹ 0.99 lakh

[(i) Miscellaneous assets proposed to be purchased ₹ 0.19 lakh
*(ii) Advance payable to lessor ₹ 0.80 lakh

₹ 0.99 lakh

*Advance payable to lessor is treated as an asset since it will remain with the lessor and it is always refundable when the lessee vacates the premises.
(j) Preliminary and pre-operative expenses : ₹ 0.21 lakh

[(i) Insurance premium on fixed assets at 0.6% per annum.

\[0.6/100 \times (25.22 + 1.05 + 2.63) = ₹ 0.17 \text{ lakh}\]

(ii) Interest/other financial charges payable during project implementation (since no loan component is envisaged for funding the project)

: Nil

\[₹ 0.17 \text{ lakh}\]

(iii) Other start up expenses (say)

\[₹ 0.04 \text{ lakh}\]

\[₹ 0.21 \text{ lakh}\]

(k) Working capital margin:

This head requires some clarification. We know that working capital margin is the difference between working capital requirement and working capital finance. In other words, it is the promoter's contribution towards working capital requirement. In the given problem, the firm is stated to be going to undertake only job orders. It is further stated that the raw material will be supplied by the customers. Hence, the part played by the firm is adding value to the raw material supplied by the customers. Thus, the question of different components of working capital viz., raw materials, goods-in-progress, stock of finished goods etc., does not arise. However, the promoter must have to meet the working expenses and administrative expenses for which he should make necessary provision in the project cost. A minimum of one month rent, wages and salaries, repairs/maintenance charges, power charges etc., are to be provided for.

These items in effect from part of the working capital funds required for running the unit. It is stated in the problem that the customers are expected to pay the charges immediately on taking delivery of the finished products. If, for example, the customers are likely to pay only after two months, the unit will start earning only two months after it first dispatches the finished products. In such a case the working and administrative expenses shall have to be provided for a minimum period of over two months (i.e., two months plus the processing time required for the dispatch of the first batch of finished products). Since in the given problem, it is given that the customers will pay immediately and as the processing time required for finishing the raw material is also not indicated, we can assume one month requirement and provide for one month working and administrative expenses. For units that undertake purely job orders, working capital limits are not sanctioned by banks (except in cases where the working expenses alone form a predominant portion of the total expenses like the software industry etc.). Hence, the entire requirement is expected to be brought in by the promoters.

In respect of projects that are set up exclusively to undertake job orders, the component ‘working capital margin’ can be replaced by the component ‘working capital requirement’ in the project cost.
Thus, the working capital requirement for M/s A.B.C. Industries is given by,

Rent — 1 Month : ₹ 0.08 lakh
Wages and salaries — 1 Month : ₹ 0.55 lakh
Administrative and other overheads — 1 Month : ₹ 0.09 lakh
Power charges — 1 Month : ₹ 0.07 lakh
Repairs and maintenance charges — 1 Month : ₹ 0.11 lakh

[Assumed @ 5% on machinery cost, per annum,

\[\frac{(5/100 \times 25.22) \times 1/12}{\text{Total working expenses}}\]

1 Month : ₹ 0.90 lakh

Thus, the estimated project cost is as under:

\[
\begin{array}{ll}
\text{Project cost} & \text{[₹ in Lakh]} \\
(a) Land & \text{Nil} \\
(b) Land development & \text{Nil} \\
(c) Buildings & \text{Nil} \\
(d) Plant and machinery (including electricals) & 25.22 \\
(e) Transport and erection charges & 1.05 \\
(f) Contingency & 2.63 \\
(g) Know-how/consultancy charges & \text{Nil} \\
(h) Miscellaneous assets & 0.99 \\
(i) Preliminary and Pre-operative expenses & 0.21 \\
(j) Working capital requirement & 0.90 \\
\hline
\text{Project cost} & 31.00 \\
\end{array}
\]

4.3 ORDER OF MAGNITUDE ESTIMATE

We have so far seen the method of arriving at the project cost by estimating the cost of individual components of the project. This is done after having decided upon a project and after forming a rough idea about the size of the project. At the initial stage of project formulation, a project promoter may like to know about the approximate cost of the project that he envisages. Only after knowing the approximate cost of the project that he has in mind, he can go for further detailed study. There are some methods available that are useful to estimate the likely cost of a proposed project. These methods of estimating the project cost (known by the term 'Order of magnitude Estimate') are very rough, approximate but quick estimates. They serve the purpose of giving a first hand information about the capital investment required without going into the finer details of the project.

The following are some of the methods used for arriving at a rough estimate of project cost.

(a) Investment Per Unit of Output

The investment pattern of similar existing projects are compared with the proposed project. For example, if the likely investment on a project for setting up a cement plant is required to be estimated, the investment made on an existing cement plant is taken as reference.
Let

\[ I_e = \text{Investment made on an existing project} \]
\[ C_e = \text{Installed capacity of the existing project} \]
\[ I_p = \text{Investment required for the proposed project} \]
\[ C_p = \text{Installed capacity of the proposed project} \]

Then,

\[ I_p = \frac{I_e}{C_e} \times C_p \]

The technology/process of manufacture used in the project taken for reference should be the same as the technology/process of the proposed project. This method assumes that the investment required is proportionate to the installed capacity and that the project cost for a certain capacity will hold true for all capacities provided the technology/process is the same.

(b) Turnover Ratio

This method takes the ratio of sales turnover to investment as the reference.

Let

\[ T_e = \text{Turnover achieved by an existing project} \]
\[ I_e = \text{Investment made on the existing project} \]
\[ T_p = \text{Turnover of the proposed project} \]
\[ I_p = \text{Investment required for the proposed project} \]

Then,

\[ I_p = \frac{I_e}{T_e} \times T_p \]

(c) Inflation Index

This method gives fairly accurate results. This method compares the investment made on a similar project with the same capacity as that of the proposed project. The investment made on an existing project (of similar nature and similar capacity) is taken as reference and this investment is corrected for the inflation that has taken place during the time gap of investment on the two projects.

Let

\[ I_e = \text{Investment made on an existing project (of the same capacity as the proposed project)} \]
\[ I_p = \text{Investment required for the proposed project} \]

Then,

\[ I_p = I_e \times \frac{\text{[Consumer price index (present)]}}{\text{[Consumer price index (at the time of investment on the project that is taken as reference)]}} \]

(d) Six-tenth Factor

This method is a variation of the ‘Investment per unit of output’. In this method, the investment is assumed to vary as a power of 0.6 of the ratio of installed capacity of the proposed project to the installed capacity of the existing project.
As per the ‘Investment per unit output’ method,

\[ I_p = \frac{I_e}{C_e} \times C_p \]

As per ‘Six-tenth Factor’ method,

\[ I_p = I_e \times \left(\frac{C_p}{C_e}\right)^{0.60} \]

(e) Location Index

When similar projects are not available within the country for comparison, similar projects implemented abroad can be taken as reference for arriving at a tentative estimate of the cost of the proposed project. For example, when a nuclear power project is set up in a country for the first time, the likely investment on the project can be judged only by comparing similar projects existing in other countries. The tentative estimate of project cost arrived at may be corrected by applying suitable correction factors to account for the difference in cost of material and cost of labour between the two projects.