
UNIT 12 PROJECTS : CONCEPT AND PHASES

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12.1 INTRODUCTION

A project is a set of activities related to the achievement of some planned objective, normally where the objective is unique or non-repetitive in nature. Thus, a project is usually distinguished from repetitive or continuous production processes by the characteristic of uniqueness, or the "one shot" nature of the objective.

Here, this will not be out of the point to mention that in project to achieve the objectives planning and control are the major tools to combat the overruns, but to conceive a project rather before the start of construction activity, there are various activities involved to implement the project.

The project development cycle comprises the pre-investment, the investment and the operational phases. Each of these three major phases is divisible into stages, many of which constitute important industrial activities. Several parallel activities take place within this phase and even overlap into succeeding investment phase. Thus, once the early stages of pre-investment studies have produced fairly dependable indications of a viable project, investment promotion and implementation planning are initiated leaving, however, the main thrust to the final evaluation stage and investment phase.

Feasibility study is one of most important activity during the pre-investment phase. Complete and detailed feasibility studies covering all aspects of a project is a vital requirement for the success of the project. It should define and analyze the critical elements that relate to the production of a given product together with alternative approaches to such production. Such a study should provide a project of a defined production capacity at a selected location using a particular technology or technologies in relation to defined materials and inputs, at identified investment and production costs, and sales revenues yielding a defined return on investment. The feasibility study should describe the optimum process justify the assumptions made and the solution selected, and define the scope of the project as the integration of the selected partial alternatives. If, however, the project is not viable despite all alternatives reviewed, this should be stated and justified in the study.

A feasibility study may be either market-oriented or based on material inputs, i.e. it derives its initiative from an assumed or existing demand or from available material inputs such as raw materials or energy.

A feasibility study is not an end in itself, but, only a means to arrive at an investment decision that need not agree with the conclusions of the study. In fact, it would be rare to find investor response so flexible as to fully conform to the results of such a feasibility study.

Objectives

The major objective of this unit is to give a better understanding of the various tasks under the pre-investment phase of an industrial project. However, after studying this unit, you should be able to

- describe various statutory requirements,
- prepare various reports and documents normally furnished, and
- interact with various authorities for clearing the projects.

12.2 DEVELOPMENT OF PROJECTS

It is common knowledge that a country's economic development is achieved through various industrial and infrastructural development projects and that industrial growth depends on the country's infrastructure.

In India, development process in the real sense, using science, technology, engineering and construction, began only in the year 1951, that is, with the First Five Year Plan.

12.2.1 History and Projections

From 1951, till 1989-90, financial outlay totalling Rs. 787,591 crore has been invested in development projects. These huge sums have been distributed among the heads of development like Agriculture and Allied Activities, Energy, Industry and Minerals, Transport, Communications, Science, Technology and Environment, Irrigation and Flood Control, Rural Development, Special Areas Programmes, Housing and General Economic Services. In the Eighth Plan (1992-97), out of a total outlay Rs. 798,000 crores, investment in the public sector will be Rs. 434,100 crore, while the private and household sectors' in various projects will account for the balance. India has, since independence, achieved substantial economic growth through industrial and infrastructural development projects. But, on a worldwide comparison, and when seen against the country's needs, the overall development achieved till date is negligible.

12.2.2 Some Cases of Monumental Project

A few recent past examples of disastrous mismanagement of public sector projects, taken from different sectors and briefly discussed here, will help in a better perception of the prevailing situation.

In the Atomic Energy Sector, the Narora Atomic Power Plant of 2×235 MW capacity at Bulandshahar in U.P. was approved by the Central Government in January 1974 with an estimated total cost of Rs. 209.89 crore, and the two units were to be commissioned before March 1982. The project has suffered more than 10 years delay and Rs. 535 crore cost overrun. It was a case of failure on the part of the owner and/or executing authority not to do timely planning and integrated team management of all agencies involved.

In the Coal Sector the Moonidih Underground Project of 2.1 million tonnes/year capacity was seven years of schedule and seventeen years of overrun, raising its cost from Rs. 15.49 crore to Rs. 158.38 crore. This record-breaking classic example of project failure is attributable to indecision and lack of coordinated efforts which led to delay in finalizing technology and equipment, with continued changes in the scope of the project, and delay in the supply of long wall face equipment.

In Steel, the colossal overruns experienced by Vizag Steel Project with a time overrun of 56 months and cost overrun of Rs. 6,093 crore are the result of wrong estimates, bad fund flow, inordinate delay in civil work and equipment supplies by public sector enterprise, and failure on the part of the State Government to provide water on time. The root causes of all this failure is the consultant's inadequate exercises at the formulation stage, insufficient funding arrangements, and undeserved protection to the public sectors vendors and contractors.

The four million tonne expansion projects of both Bokaro and Bhilai have overrun by 8 years and $7\frac{1}{2}$ years respectively, with cost overruns of Rs. 1,251 and Rs. 1,350 crore, respectively, their percentages being 132 and 144. In fact, simultaneously, Bokaro Steel's captive power plant work had also overrun and wasted over Rs. 80 crore additionally. Non-freezing of specifications, "go ahead" clearance without a final plan, delay in supplies, delayed despatches by USSR and Poland and failure by public sector construction contractors are the main factors responsible for this.

In Petroleum & Natural Gas, the delay of over 6 years and the cost overrun of 200 percent amounting to Rs. 106 crore in the construction of Polystaple Fibre Plant in Bongaigaon were caused by law and order problems and infrastructural inadequacy.

In the Power Sector, Dulhasti project in J & K, and Panchat II and Koel Karo, both in Bihar, all hydroelectric projects, illustrate the inefficiency of power projects. Dulhasti with over 44 months delay and cost overrun of Rs. 1572 crore over the estimated cost of Rs. 183 crore; Panchat II with 128 month delay and cost overrun of Rs. 47 crore over the estimated cost of Rs. 16 crore; and Koel Karo with indefinite delay and cost overrun of Rs. 894 crore over the estimated cost of Rs. 445 crore, are among the bad examples of project management failures.

Admitted causes are : delay in land acquisition, adverse geological conditions, tunnel failure, law and order problems and contractors' failure. The lapses of the owner and project authorities and the lack of involvement of State Governments have not been examined.

12.2.3 General Causes of Overruns

The general causes of overruns that have become a common feature of Indian Projects at different phases, as revealed by a detailed research on several past and ongoing projects are as follows :

Pre-feasibility Study Phase

- * Delay in land acquisition, forest clearance and environmental clearance.
- * Delay in clearances from financial/regulatory bodies of the Government.
- * Lack of infrastructural facilities.
- * Failure in planning for important resources, facilities, tie-ins and inputs needed for timely construction and putting into operation.
- * Selection of incompetent consultant.

Evaluation Phase

- * Inadequate project study, understatement of scope and underestimate of cost and resources, calling for subsequent changes in the scope of the project; non-freezing of specifications; and revision of budgets.
- * Political influences in site selection.
- * Consultants' and project authorities' inadequacies, leading to wrong economic studies and misleading fund flow statements and projections, causing financial impediments.

Technology Selection and Engineering Phase

- * Poor outdated technology acquisition.
- * Technological tie-ups more on consideration of credit offered by the supplier rather than of technical necessities.
- * Starting of detail engineering and preparation of shopping lists before finalising process flow-sheets and line diagrams.
- * Delay in completing detail engineering; lack of design data; delay in the freezing of design and specifications; absence of an engineering schedule, leading to delay in the release of drawings for procurement.
- * Inefficient procedures for scrutiny, approval and transmittance of drawings and specifications.

Contracting and Procurement Phase

- * Delays, slipshod preparation of bid documents.
- * Poor selection of vendors/manufacturers/fabricators/suppliers and contractors and preferential treatment to public sector enterprises, on the basis of Government's guidelines.
- * Delayed placement of orders.
- * The practice of accepting the lowest quotation, irrespective of the vendor qualities and/or contractor's competency.
- * Delay in the issuance of import licenses, permits and various clearances.

- * Delay in the opening of letters of credit and issuance of various guarantees to foreign suppliers.
- * Time-consuming procedures concerning the procurement of imported raw materials and high-tech components by Indian manufacturers of equipment
- * Inadequate expediting actions.
- * Lack of integrated action plans closely involving suppliers and contractors
- * Delay in the supply of critical equipment.
- * Lack of proper quality control arrangements – at various levels and in final stage, and consequent defects in equipment.
- * Changes and modifications without cost-benefit analysis.
- * Poor logistics planning.

Construction Phase

- * Very early starting of construction activities, before ensuring the availability of working drawings, storage and pre-assembly space, sequential supply of equipment and materials and adequate infrastructure.
- * Delay and/or inadequacy in contractors' mobilisation.
- * Poor planning by contractors.
- * Lack of close co-ordination and owners' serious involvement.
- * Failure to assure contractors of law and order in the project area.
- * Contractor's low productivity and consequent financial problems.
- * Inefficiency of contractors, in both the public and private sectors.
- * Hold-up resulting from delays in interconnected activities, because of the absence of integrated management.
- * Belated clearances.
- * Indecision and delayed decision-making.
- * Bad quality control.
- * Lack of micro-level schedule control with reference to the macro plan of the project.
- * Unfair treatment to contractors and suppliers.
- * Delay in replacement supply.

12.2.4 Sound Management Practices Necessary to Combat Overruns

The chief aim of project management is project success, with reference to time, cost and quality. Project management is an integrated multidisciplinary function aimed at achieving project success through proper planning, organizing, execution and control.

Total project management is the whole process of creating a productive wealth or a fixed asset, capable of producing goods or generating services. This process encompasses all functional disciplines of business management with their nuances peculiar to the special features of formulating, planning and implementing a project, and is therefore, multidisciplinary in character. It is usually a task force consisting of members from various functional department, viz. Planning, Design and Engineering, Operation and Maintenance, Finance, Procurement and Material Management, Construction, and Personnel & General Administration.

Components of Project Management

The main components of project management are :

- * A clearly defined project objective.
- * An integrated project team, consisting of the representative of :
 - The owner and/or executing authority.
- * The consultant.
- * The main contractors.

- * Suppliers of critical equipment.
- * Funding institution and all agencies which have a major role in the project
- * The central and state government, where relevant.
- * An integrated total project plan, broken down into tasks and activities, with daily targets.
- * The necessary resources.
- * An effective quick-hitting control system.
- * Commitment on the part of the people involved.

SAQ 1

- (a) How the project is distinguished from other type of production process ?
- (b) What are the different phases of project development cycle ?
- (c) What is importance of feasibility study ?
- (d) What are the general causes of overruns ?
- (e) Why do you think project management essential to achieve project success ?

12.3 VARIOUS PHASES OF THE PROJECTS

UNIDO has divided project cycles into phases and stages as follows :

- (1) **Pre-investment Phase**
 - (a) Identification of investment opportunity (Project Idea).
 - (b) Preliminary selection stage (Pre-feasibility study).
 - (c) Project formulation stage (Techno-economic feasibility study).
 - (d) Evaluation and decision stage (Evaluation report and Detailed Project Report).
- (2) **Investment Phase**
 - (a) Negotiation and contracting stage.
 - (b) Project design stage
 - (c) Construction stage
 - (d) Start-up stage
- (3) **Operational Phase**
 - (a) Short-term views
 - (b) Long-term views

Regardless of the division made for the convenience of handling a large engineering and construction project goes through major activities of :

- (i) Analyzing social, financial, economic and technical cost-benefits and feasibility.
- (ii) Obtaining various clearances and approvals.
- (iii) Financial arrangements.
- (iv) Engineering and Design.
- (v) Procurement, contracting and construction.
- (vi) Commissioning and stabilizing the operation and maintenance.

UNIDO's stage 1(b), 1(c) and 1(d) coincide with the Government of India's practice of three stage project scrutiny, namely

- (i) pre-feasibility study, (ii) techno-economic feasibility study and
- (iii) detailed project report.

12.3.1 Project Identification

When a project idea occurs, you have to visualize and identify it as a wealth-creating and a goods producing or a service-generating enterprise or facility. Such identification has to be done with reference to the country's developmental strategies and long time economic policy, so that, when completed, it fits well into the total economic system or development networks, capable of being fully utilized. Every project that is identified for implementation, even if it is a private enterprise, must serve an economic and/or social need of the country in general and society around it in particular, for a long time to come. The Central Government's Planning Commission and Departments of Economic Affairs and Industrial Development give guidance in these matters. Even State Government has industrial development organizations set up for guiding and assisting entrepreneurs.

Opportunity study is aimed at identifying an investment opportunity to take commercial advantage of natural resources and factors of production available in abundance at a place, with potential for conversion into goods or services.

12.3.2 Pre-feasibility Report and its Clearance

Project formulation report or project opportunity study report or pre-feasibility report is the document which elicits the preliminary sanction or the first stage clearance by the Government and/or the Board of Directors of the enterprise, for further feasibility study of a project. A clearer report will elicit a faster clearance. The objective of appraisals in the various stages of evolution and project decision is to ensure that the project is viable from the following angles :

- Market demand for the projects' end-product and plant capacity.
- Materials and inputs.
- Location and site.
- Project engineering and investment costs.
- Plant organisation and overhead costs.
- Manpower.
- Implementation schedule.
- Financial and Economic evaluation.
- Statutory clearance.

While it is true that one should expect a pre-feasibility report to contain precise details and accurate figures, it is necessary that attempts are made to give even in the pre-feasibility report the best available information. Also, if any aspect, favourable or adverse, calls for special attention in making a decision, that aspect should be highlighted in sufficient detail. Particularly to be highlighted is the cost for any foreign process/technology to be acquired, its age and obsolescence and its Indianisation plan. Simultaneously, with the submission of PFR, you may go ahead with your action to obtain the other clearances required, which, depending on the type and location of the project, may include all or most of the clearances.

A gross idea of cost components are also considered in pre-feasibility estimates. The principal types of estimates are as follows :

- (i) **Order of magnitude estimate** : This is desired from the cost reports of completed projects. Probability of this estimate's accuracy is generally between (25 and 40 percent).
- (ii) **Preliminary control estimate** : This is prepared generally after the completion of the process design and major equipment listing. Accuracy of this estimate may be between (15 and 25 percent).
- (iii) **Definitive estimate** : This is prepared as soon as the basic engineering is completed, and bulk material take off sheets are made. Accuracy of this may range from (10 to 15 percent).
- (iv) **Detailed estimate** : This is prepared when design engineering and preparation of production drawings and final material lists have been completed and prices of all materials ascertained. This may improve the accuracy to 5 percent, leading to revision of provisional budgets.

12.3.3 Estimates and Techno-economic Feasibility Report

Techno-economic feasibility Report is the second stage of the evolution phase where the project scope is described, its size and methods determined; suitability of the site, the required natural resources and raw materials investigated and more accurate estimates made of process and non-process equipment, buildings, offsite facilities and other assets, their costs, etc. and the total feasibility of the proposal studied in-depth and cleared.

Preparation of Techno-economic feasibility Report is an arduous task to be accomplished with a great deal of care and functional interface of your total organisation. The information and figures given in pre-feasibility report have to undergo a lot of refinement to find their places in Techno-economic feasibility report. The objective is to include enough data to enable a proper assessment of the technical, financial and economic feasibility of the proposed project. Information generally contained in the report are as follows :

- Project background and description.
- Market and plant capacity.
- Materials and input.
- Location and sites.
- Project engineering and investment cost.
- Plant organisation and overhead cost.
- Manpower.
- Implementation schedule.
- Financial and economic evaluation.

Estimating the project cost is an important activity for preparing the techno-economic feasibility report. Although the estimate at this TEFER stage is still preliminary or pre-definitive and subject to further refinement at the later definitive/detailed estimation, care must be taken to keep down the level of uncertainty by making the best use of process flow sheet and other available information sources. The usual practice to prepare capital cost estimates is as follows :

- Prepare detailed schedules for every cost component, listing item description, quantities, rate or prices assumed and total amounts.
- Prepare a summary sheet for every component.
- Make a top sheet covering all components, providing separate columns for foreign exchange, local cost and total cost.

The Industries and Commerce Department of several State Governments offer incentives to the entrepreneurs for rapid industrial development. The incentives may include the following :

- Relief of sales tax or octroi or entry tax.
- Land for setting up new units and for expansion of existing units.
- Contribution towards the cost of feasibility and project report.
- Subsidy on power.
- Financial assistance in the form of term loan or working capital loan.
- Housing scheme.
- Supply of raw materials, etc.

Export oriented units and unit set up in export processing zones which undertake to export their entire production of goods are eligible for the following incentives and concessions :

- Concessional rent for lease of industrial plots and standard design factory buildings/sheds allotted for the first three years.
- The International Price Reimbursement Scheme (IPRS) on the purchase of iron and steel, which will help the unit in pricing the end-product competitively in the international market, without being affected by higher domestic price paid for iron and steel.
- Tax holiday by exemption from payment of corporate income tax for a block of five years in the first eight years of operation.

- Clubbing of Net Foreign Exchange (NFE) earned by the unit with the NFE of the parent/associate company in the Domestic Tariff Area (DTA) for the purpose of according 'export house status' based on export earning.
- Concession in duty and taxes.
- Foreign equity participation upto 100 %.

Before deciding on investment, the total financial viability of the project is to be examined closely from the angles of :

- (i) Profitability or rate of return (ROR)
- (ii) Cash Flow.
- (iii) Pay-back of investment.

Profitability, cash flow and repayment capacity shall be computed and analysed and reported from the angle of :

- Net present value of cash flow (NPV)
- Internal rate of return (IRR)
- Pay-back period (PBP)
- Simple rate of return (SRR)
- Break-even point (BEP)
- Sensitivity analysis (SA)

12.3.4 Detailed Project Report

This is the last and the most important stage of the pre-investment phase of any project. Detailed Project Report (DPR) preparation should be undertaken only after obtaining the investment decision based on Techno-economic feasibility report, so that the expensive efforts involved in the preparation of DPR are not wasted. For preparing firmed-up estimates with about 15 percent accuracy to be submitted with DPR, and the documents like process design, layout drawings and construction data are necessary for DPR preparation. Although you have a time limit up to one year from the TEFR clearance for submission of DPR.

The outline and the items of DPR are the same as of the TEFR. All the vital aspects of location and site costs, process/technology, market demand, plant capacity, product revenue, production costs, profitability, economic benefits, etc. have to be gone into in greater detail and reported on. The basic difference is the level of accuracy. To develop a DPR from TEFR, you have to :

- breakdown all project components, time-phase and schedule them with accurate cost estimates, by way of deviation from TEFR with explanations giving the improved basis of assumptions and calculations,
- develop baselines for controlling time and cost during the implementation of the project, and
- prove your preparedness with all the technical and resources requirements, to implement the project.

All Detailed Project Report must indicate the parts components, etc. with approximate annual quantities proposed to be procured from ancillary industries around the project, for use in construction, operation and maintenance. This has to be supported by a clearance from the Development Commissioner, Small Scale Industries of the area.

While applying for grant of letters of intent and industrial license, where applicable, the items proposed to be procured from ancillary industries around project be spelt out.

Following documents and data are necessary for preparation of DPR :

- Process/System design.
- Raw Materials/feedstock and project specification.
- License fee for technology.
- Engineering plan and Engineering Manpower curves.
- Final Flow diagrams.
- Heat and material balances.

- Piping and instrumentation diagrams for process and utilities.
- Layout plans for buildings, equipment, utilities and off-sites.
- General Project Specification.
- Soil investigation report.
- Single Line Electrical Drawing.
- Construction Plan and Manpower Deployment Plan.
- Environmental Protection Plan.
- Equipment List with specification and data sheet.
- Resource Schedules.
- Organisational Charts and manpower curves.
- Water and Power Supply Guarantee.

12.3.5 Project Clearances

Besides the techno-economic and financial clearances, a good number of other clearances are necessary for project implementation. While some of them are technical requirements, others are statutory – but all regulated by the Government.

Various clearances for a project are given below :

- Soil investigation report
- Clearance under the Monopolies and Restrictive Trade Practices (MRTP) Act
- Industrial License/Letter of Intent
- Approval of foreign collaboration
- Approval for appointment of foreign consultant
- Foreign exchange clearances
- Import of capital goods
- Approval for setting up export oriented units
- Environmental/Pollution Control Clearances
- Clearance from the International Airport Authority
- Railway Clearance
- Electricity Clearance
- Explosives Clearance
- Forest Clearance
- State Industries Department Clearance

12.3.6 Project Financing

Many project failures resulting from unplanned, untimely and insufficient financing, mainly attributable to commencement of implementation before making adequate funding and disbursement arrangements.

Sources of financing are not common for the various public, joint and private sector project enterprises. Some of the sources available to the public sector are not available to the private sector, while some others available to the private sector are not available to the public sector.

The main sources of project finance are as follows :

- Equity and Preference Share Capital
 - Promoter group's contribution.
 - State Government contribution.
 - Public subscription.
 - Seed capital assistance.
 - Risk Capital and Technology Finance Corporation Ltd.'s assistance.

- Technology Development and Information Company of India's assistance.
- Share subscription by financial institutions and mutual funds.
- Share subscriptions by NRIs.
- Employees stock exchange.
- Preference shares or Preferred stock.
- Central and state capital subsidies, sales tax loan and development assistance.
- Internal generation of funds
 - Retained profit.
 - Depreciation.
- Lease financing
- Public Sector Bonds
- Debentures
- Long-term rupee loans
 - From all-India development banks and investment institutions.
 - Sundry sources of long-term loans.
 - Inter-corporate loans.
- Central Government budgetary support
- Foreign Currency Funds
 - Free foreign exchange from FE dealers and loans from development banks.
- External commercial borrowings
- External aid
 - Bilateral aid.
 - Multilateral aid.
- Assistance from International Finance Corporation
- Investment from Oil Exporting Developing Countries (OEDCs)
- Collaborator's equity participation in foreign exchange
- Share subscription by overseas investors
- NRI and OCB Share subscription in foreign exchange
- Short term rupee funds for working capital
 - From commercial banks.
 - Public deposits.
 - Debentures/Bonds.
 - Suppliers' credits.

SAQ 2

- (a) What are the major activities, a long engineering and construction project goes through ?
- (b) What are the three stages of project scrutiny which Govt. of India is adopting ?
- (c) What are different factors for assessing the viability of a project ?
- (d) What is Techno-economic Feasibility Report ?

12.3.7 Technology Transfer and Foreign Collaboration

The success of the end-product of your project would depend almost entirely on the quality of the production technology or process know-how you have used and the efficiency of the production facility you have created. In fact, every project owner likes to use the state-of-the-art technology for his projects' best performance, productivity and profit, especially at the present time when there are rapid technological advances all around him.

The technology policy of the Government aims at making the country technology self-reliant; but at the same time, as the country is not technologically self-sufficient, permitting transfer of advanced foreign technology to India. For local absorption, adaptation or Indianisation and further improvement, with due consideration to Indian economic objectives and natural resources.

Besides conforming, in general, to the Government's industrial and technological policy, every technology transfer agreement should, in particular, be clear in regard to the nature and scope of the technology transfer. It should place at your use the collaboration-technology-owner's (i) Knowledge, (ii) Experience, and (iii) Skill necessary to :

- (a) Set-up the sturdiest, but at the same time inexpensive, production which is easy to operate and maintain.
- (b) Produce the planned goods or services in a manner capable of capturing the local and foreign markets within the shortest period of time keeping within the national economic parameters.

The level of sophistication of the technology should be determined with reference to the type of demand and the competition that your product is likely to face from others.

The Government's Department of Industrial Development in the Ministry of Industry has a Technology Data Bank, which gives information on a wide choice of technologies and collaborators. The most appropriate technology should be chosen to suit your project in the Indian environment, which, for some more years to come will be labour-oriented and not highly sophisticated nor substantially automated. The factor relevant to Indian conditions is the need to use local raw materials local infrastructure and other locally available inputs to the fullest possible extent. The environment in which the undertaking is set up and the type of equipment and production technique employed are inter-related. The national economic policy is also in favour of this inter-relation. Our developing economy has a certain level of technology absorption capacity. So it will be ideal if you choose a technology suited to that level, with the potential for improvement, keeping pace with the changes in our socio-economic environment.

The phases of Technology Transfer are sequentially as follows :

Choosing → Source Searching → Negotiation → Contracting

The principal forms of Technology Transfer are :

- Licensing.
- Outright Purchase.
- Joint venture with capital participation.
- Technology transfer with buy-back guarantee.
- Technology transfer with loan agreement.
- Technology transfer with plant operation and management contract.
- Technology transfer forming part of a consultancy contract.
- Technology transfer forming associated with equipment supply contract or turnkey contract.

The technology absorbed by an enterprise has to attain maturity and keep improving in the Indian environment with continuous commercial exploitation, keeping pace with consumer demand. In a world faced with technology explosion, the challenge of avoiding the repetitive import of the same technology with all the latest development can be met only through continuous in-house R&D efforts. Foreign collaboration, envisage two types of participation by well established foreign companies in Indian projects in their specialized fields. They are :

- (a) Collaboration for technical participation under which an engineering and production technology passes onto the Indian side.

- (b) Collaboration for technical and financial participation in an Indian project by a foreign party. Foreign collaboration is a complex part of the total project management spectrum.

Government's policy for foreign collaboration is based on national priorities. Foreign collaboration is permitted liberally in the certain groups of high priority industries and export-oriented units, and selectively in other cases. Foreign collaboration should generally aim at integrating our industry into global/economy. The policy is guided by the following objectives :

- Attaining technological competence and self-reliance, to reduce vulnerability, particularly in strategic and critical areas, making the maximum use of indigenous resources.
- Providing maximum gainful and satisfying employment to all strata of society with emphasis on employment of woman and weaker section of society.
- Using traditional skills and capabilities, making them commercially competitive.
- Ensuring maximum development with minimum capital outlay.
- Identifying obsolescence of technology in use and then arrange for modernisation of both equipment and technology.
- Developing technologies, which are internationally competitive, particularly those with export potential.
- Reducing demand in energy, particularly energy from non-renewable sources.
- Improving production speedily through greater efficiency and fuller utilization of existing capabilities, and enhancing the quality and reliability of performance and output.
- Ensuring harmony with the environment, preserving the ecological balance and improving the quality of the habitat.
- Recycling waste material and making full utilization of byproducts.

12.3.8 Appointment of Consultants

You will find that most of the project owners use the services of a consultant – an individual consultant or a consulting firm, or a captive consulting organisation, throughout the project duration. Even when the owner has a competent project team, a consultant may be appointed for the following reasons :

- The functional experts of various disciplines who are members of the project team will have many other responsibilities, which are bound to divert their attention from the particular project.
- A multi-disciplinary consultant's deep knowledge, rich experience and concentrated attention to all important aspects of a project will, no doubt, boost its efficiency, justifying the consultancy cost.
- An independent consultant will view all matters in an unbiased manner.

General issues concerning the appointment of a project consultant in the Indian conditions are the following :

- (a) Determination of the consultant's role in the project.
- (b) Types of consultant.
- (c) The role of domestic consultant.
- (d) Selection and appointment.
- (e) Terms of preference.
- (f) Actual use of consultant.
- (g) Co-ordination procedure.
- (h) Professional liability.

Generally, the selection process comprises the following steps :

- Determination of the consultant's role.

- Determination of prequalification criteria.
- Estimation of the expendable consultancy cost.
- Short-listing or pre-qualification of consultants.
- Determination of final selection criteria.
- Determination of selection procedure and designing of forms for consultant's work proposals, bio-data and consulting experience of his firm as a whole or of the members individually proposed to be employed on the project.
- Invitation of work proposals and bids from the short-listed ones.
- Evaluation of capabilities on the basis of the work proposals, data and bids received.
- Selection of one or more consultants for the whole project or for different assignment or work package.
- Negotiation on terms of conditions.
- Appointment.

The principal types of appointments are given below :

- Consulting firms retained by owners, with the lending institute's approval, following the selection procedure prescribed or agreed to by the lending institute.
- Consulting firms retained by the lending institutes playing the role of executing agency.
- Consulting firm engaged as Engineering firm, acting alone or in joint venture with one or more other agencies, to provide total turnkey packages comprising all services and supplies.
- Individual consultants retained by owners.

SAQ 3

- (a) What are the incentives offered by the Industries and Commerce Department of several State Governments ?
- (b) What are the other incentives for which export oriented units are eligible ?
- (c) What are the different project clearances which are necessary for project implementation ?
- (d) What are the main resources of project finance ?
- (e) What are the objectives behind foreign collaboration ?
- (f) Why does a project owner feel the requirement of consultants in his project success ?

12.4 SUMMARY

Project is a set of activities related to the achievement of some planned objective. In a project object is normally unique and/or non-repetitive in project planning and control are the major tools to combat the overruns. The study of unit provides better understanding of the various tasks under the pre-investment phase of an industrial project. Unit also described some cases of monumental projects in India which are delayed and overruns. Root causes are analysed. For achieving project success, requirement of Project Management is felt. Components of Project Management are explained in detail. Unit tells about various phases of the projects and Government of India's practice of their scrutiny. Pre-Investment, investment and operational phases are three phases of projects. Pre-feasibility study, Estimates and Techno-economic feasibility study and Detailed Project Report are three stages, Government of India practices for scrutiny. Under Techno-economic feasibility a

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detail description of various incentives and concessions for industry is given. Under Detailed Project Report a list of documents and data necessary for preparation of DPR is given. Various project clearances which are necessary for project implementation are listed. Unplanned and insufficient finance always results into project failure. Main source of project finance are given in the unit.

The success of the end product of project depends on the quality of the production technology. In many cases, country is not technologically self-sufficient, therefore, one may use the collaboration with technology knowledge, experience and skill. The principal forms of Technology transfer are listed.

The project owner always appoints a consultant to have use of deep knowledge, rich experience and concentration attention of consultant. General issues concerning appointment of a project consultant in the Indian condition are pointed out along with selection process.

12.5 ANSWERS TO SAQs

Refer the relevant preceding text in the unit or other useful books on the topic listed in the section "Further Reading" to get the answers of the SAQs.