
UNIT 5 FORMULATION OF DETAILED PROJECT REPORTS

Objectives

After going through this unit, you would understand:

- the significance of design phase in project life cycle
- DPR and its importance in a Project
- major contents of DPR
- the broad sequences to DPR formulation
- the capabilities required to prepare a DPR
- how to evaluate a DPR.

Structure

- 5.1 Introduction
- 5.2 Planning as an Essence of Design Phase
- 5.3 Market Planning
- 5.4 Equipment and Process Technology
- 5.5 Location of the Project
- 5.6 Layout of the Project
- 5.7 Material Balance of the Project
- 5.8 Specification of Main Plant and Equipment
- 5.9 Environment Impact Assessment
- 5.10 Operations
- 5.11 Commercial Aspects
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- 5.14 Who Prepares as DPR?
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5.1 INTRODUCTION

You have seen in the overview section that the second phase of the life cycle of a project is the Design phase. This follows feasibility and is subject to an affirmative investment decision: This must give you a clue as to the importance of this phase. It is a costly and time consuming process, and therefore, it is taken up only after the feasibility stage leads to an investment decision. Typically about 10% of the total cost of a project is spent on its design. Hence it is important that Feasibility studies and Appraisals are adequately done and the decision to go ahead with the project is a well thought out corporate decision.

In this chapter, you would learn in some more details about the design phase of a project, the output of this phase being the detailed Project Report (DPR)

5.2 PLANNING AS THE ESSENCE OF DESIGN PHASE

If you look at this phase in another way, it can also be called a planning phase and the DPR is nothing but a very detailed and elaborate plan for a project, indicating the



overall programme, different roles and responsibilities, and activities and resources required. By now, through your experience and studies of Management, you are well acquainted with the important role that planning plays in any successful managerial endeavours. In fact, it is the key to the success in any human endeavour. Therefore, you would appreciate that the success of a project depends largely on the quality of this planning exercise; the quality of the design itself. The success of a Project may be measured on the basis of a few critical parameters:

- Whether the project was completed on time
- Whether the actual cost of the project was within reasonable limits of escalation over the original estimates
- Whether, after completion of the project, the facilities are able to generate the expected quantity and quality of the products and/or services at profitable costs
- Whether the project's gestation period is within the planned duration

You must be careful to note that a good design is a necessary condition for the success of a Project, but it is not a sufficient condition. The plan must be truthfully executed.

However, unless the design is comprehensive enough, the execution, however accurate and true to plan, cannot lead to the success of a project.

The design provides a blue print for the construction of all facilities required in a project. It states on paper at great length and detail, what must be done to convert the corporate investment decision of a feasible project idea, into the reality of a successful, healthy profit making enterprise. It should adequately reflect top level policy guidelines on all aspects that has long term impact during the entire life of the project. It takes a relook at the appraisal, particularly the financial viability, in much greater details. It also provides the basis for all specifications, contract drawings, detailed technical design and bidding. It touches on all aspects of a project, e.g. Marketing, Technology, Finance, Project execution and operations. It indicates the nature of risks involved in the project, both during and after the project phase, with certain built in measures to counter the major risks. This plan becomes the reference point for all future monitoring and evaluation activities.

A DPR is a final, detailed, appraisal report on the project, and a blue print for its execution and eventual operation. It provides details of the basic programme the roles and responsibilities, all the activities to be carried out and the resources required and possible risks with recommended measures to counter them.

The following paragraphs would give you an idea about all aspects of a DPR. It is written with a manufactured product in mind. This would provide a most general coverage, although there may be other projects like housing, transport, hotels etc., mainly in the services sectors. Each project would have its specificity which cannot be foreseen and detailed out in a chapter on DPR, not is it intended. We shall, therefore, attempt to provide a general coverage, which would cover most but not all aspects of a specific project. It might also contain some elements, that may not be present in one specific project.

5.3 MARKET PLANNING

The starting point of any project is a felt need which is awaiting satisfaction. It may be the need for more power, housing, consumer goods, transportation and communication services or any thing else. The first step in the design of a project, therefore, is to establish and understand the nature of the need. We shall call this exercise, Demand forecasting. The other market related aspect concerns those other organizations who may also be in the same game of providing goods/ services fulfilling the same needs. In the part and more so in the present liberalized economic condition, competition is the name of the game. The DPR must, therefore, lay down plans for effectively securing a desired share of the market and maintain/enhance it. We shall call this exercise the Marketing Strategy.

The Marketing Planning section of a DPR must cover Demand forecasts for the goods/services and a Marketing Strategy for ensuring a planned market share.



a) Demand Forecasting

This is probably the most crucial and at the same time most difficult task in the formulation of a DPR. It is crucial, because the complete design of the project, its capacity, investment required and financial viability is directly related to this projection.. If it is over estimated, the project would be burdened with excess capacity, low capacity utilization and eventual loss to the enterprise. On the other hand, if it is under estimated, the project may find itself unable to meet the demand, inviting more competitors to enter the fray and mining on the opportunities derived from larger volumes of sales. It is difficult because one is trying to look into a fairly long future somewhere between 7 to 14 years. This includes about 5 - 10 years of the project life, over which the financial visibility is normally examined, and about 1 1/2 to 4 years of the project phase itself, including part of the Design phase and the whole of the Execution and Termination phases. Even for products with a life cycle of just 5 years, the forecasting period would be about 7 years. This is the main reason why, Demand forecasting for a project is significantly different from the routine annual, half yearly, quarterly and monthly demand forecasts carried out by all medium and large operating enterprises. This is not all. Once the extent of total demand has been judged, it would be necessary to analyse the nature of the competition the project might face, and the share of the market it may reasonably hope to corner for itself. The market share considerations get further complicated by the likelihood of new competitors entering the market for some or substitute products.

In view of these complexities, demand forecasting for a project relies heavily on two basic approaches and finally arrives at certain projections basest on the marriage of these two distinct approaches. These approaches are Econometric Methods and Comparative Prediction.

b) Economic Methods

These methods rely heavily on past consumption data and tries to relate past demand with certain macro economic/demographic indicators. The choice of such indicators or variables depends largely on the judgement of the analyst. The objective is to establish some functional relationship between demand (Y) as a dependent variable and the chosen independent variables. Once such a mathematical relationship has been established, the analyst uses time series data on these macro economic/demographic indicators, to predict their values in future. These values are then invested into the functional relationship to forecast demand.

c) Comparative Prediction

This method tries to predict new applications and new markets for an existing products. Such methods are particularly suitable for developing nations. A number of applications and uses may be prevalent in more developed countries, which may not be found in a developing nation. The reasons may be import restrictions, low level of supplies, high cost etc. Consider the case of stainless steel. A number of industrial, domestic and architectural applications of stainless steel is common in developed countries. Consider the example the equipment for dairy industry. As the availability of the right type of stainless steel increases, entrepreneurs may get motivated to set up dairy equipment within the country. This may open up nee avenues for generating demands that did not exist earlier. Similarly better availability has encourage gas stove manufacturers to switch over from castings and mild steel shuts to stainless steel, owing to its superior qualities.

Yet another econometric method relies on estimation of disposable income and its relationship to the consumption of a product. For example, consumption of non essential items like soft drinks. This has a close relationship with disposable income. Affluent sections of any society would consume more soft drinks, as they have enough disposable income left over, after fulfilling the basic needs of food, clothing, health, education, transport etc. For such products, a good prediction of the income trends of different categories of households would serve as a reliable. medium for demand forecasting.

Comparative predicting, attempts to examine each area of possible applications and tries to predict the level of consumption in each sector. Consider the case of gas stoves. It has a close relationship with the number of new LPG connections that are planned. The Ministry of Petroleum draws up plans for new LPG connections. The share of stainless steel stoves out of total stoves can be obtained from the major stove manufacturers. This



should enable a fairly accurate estimated or the demand of stainless steel sheets for this application. Following similar approaches, it is possible to find out an array of new applications and project demand in each area. The sum total of such new applications give another input for demand forecasting.

Yet another approach to locate and predict new sources of demand concerns a search for possible new markets for an existing product. In a country like India, where more than 70% of the population still lives in villages, rural demand and rural markets have often been targeted as potential new markets for so called urbanised products. Two wheelers that are designed to withstand rough driving conditions are a case in point. The growth in agricultural production and income generated from agriculture can serve as a good indicator of demand of products without any past record of consumption in these markets.

Similarly, rural electrification programmes open up possibilities of consumption of a most of electrical items like bulbs, fans, appliances, motors and pumps etc. New rural markets for such products could be estimated from the rural electrification targets in different states couples with estimates of rural household incomes.

d) The Nature of Product/Service

It is very clear from the above discussions that the forecasting method adopted must be suited to the particular type of product/service being considered. The same approach cannot produce reliable forecasts for items as different as stainless steel and soft drinks. It is, therefore, customary to group items into different homogeneous categories, so that similar forecasting methodologies may be adopted within one given category. An indicative list of such categories is given below:

Categories of Products/Services

Category	Examples
Basic materials/services	Cement, Steel, Power
Capital Goods	Construction Equipment
Consumer :Durables	White goods, automobiles, furnitures
Industrial Consumables	Welding rods, nuts and bolts, POI items.
Consumer Goods	Food & beverages, textiles and garments, education.

e) Secondary Data Sources

You must be wondering at the wide variety of data that is required for Demand forecasting and, their source. Government departments constitute the most important source of data. The National sample survey, Census, Plan documents and Central Statistical Organisation publications provide important data sources. The National Informatics Centre (NIC) is carrying out pioneering work in making a most of information being made available on its communication network - NICNET. For example, they have undertaken a project to link all district headquarters so that its central data bank can be assessed from every district in India. A recent example is the 1991 census data, which has a wealth of information on Indian population, education, income levels, professions and so on. One can access all these information from any district NIC centre's computer, provided it has been connected with the NICNET.

Some private organizations have help the need for specialized information and have started cataloging and publishing economic intelligences information. The Centre for Monitoring Indian Economy (CMIE) is one such establishment which regularly publishes economic information. Many good libraries now subscribe to CMIE publications and can be used.

The economic press also constitute a good source of secondary data. Every god economic news papers/magazine establishes its own Research Bureau. In addition, they invite and receive well researched articles by different professionals in academics and industry. Many libraries provide a press clippings service, enabling one to tap the information appearing in the economic media.



A number of association of industries regularly collect information that is useful for their members. Market share information can usually be obtained from such associations.

f) Primary Data

These may arise a situation where all available secondary (published) data may not be sufficient for the forecasting exercise. In such situations, it be become necessary to collect data from direct observations, interviews, mail questionnaires etc. This is a specialized task, which forms part of Market Research, There -are specialized Market Research Bureaus, who undertake market research projects on behalf of clients, on payment of certain fees. A god bureau can be entrusted to carry out a reliable market research exercise, and this may form a good input for demand forecasting.

g) Estimation of Market Share

Demand forecasting methodology, described above, leads to an estimation of the total demand for the product/service under consideration. However, it is not sufficient to estimate the total demand above. It is necessary to identify the present and future suppliers and their output capacities, so as to be able to estimate a likely share of the overall market, that the project under consideration might capture.

Information about existing suppliers (producers and importers) are relatively easy to obtain. The more difficult part may be the information regarding additional supply sources in future. This would include expansion of capacity by present suppliers, entry of new suppliers and additional imports. In the days of regulations and licensing, licenses is net served as a good indicator of prospective, suppliers.

However, with most the industries have been de-licensed, one has to rely more on the economic media which publishes future plans of medium and large corporations.

International market trends and custom tariffs and exchange rates can serve as good indicators for predicting imports. In any case, an organized effort must be made to estimate the total supplies, so as to be able to judge a market share for the project, when it goes on stream.

While carrying out this exercise of demand forecasting, it is very important to keep tract of substitute products/services. The impact on the demand for a product by substitutes have been thoroughly studied by economists. However, in case of demand forecasting for a project, it is necessary to consider the substitutes, their demand and supply situation over the forecasting period and consider their impact on the demand under consideration.

If the end of this analysis, it should be possible to have a fair estimate of the market share for the project under consideration.

h) Marketing Strategy

In the previous section, you have seen how a project authority can set a target for achieving a particular share of the estimated total demand for the product/services under consideration. In this section, you would learn the basic planning and analysis necessary to chalk out are action plan, so that the targeted market share is actually achieved. But before we go into these details, a few lines in consideration of the relevance and importance of this exercise and its inclusion in the DPR may be necessary.

You might wonder as to what marketing strategy can realistically be chalked out at such an early stage, where the DPR itself is not ready. It is true that nothing much can be done at the DPR formulation stage. However, most Project Management authorities find themselves caught in a tine trap, once they concentrate on the myriad of activities concerning, technology, finance, construction, commercial negotiations etc. Their entire attention gets focused on DPR finalization and project execution.

Marketing is often forgotten in the hectic atmosphere, so common in medium and large projects. Everyone tries to meet deliveries and schedules, and one fine day, the trial runs begin, soon to be followed by commissioning. It is already too late for a beginning on Marketing the product/service. The project may be successful, so far as fulfilment of time and cost schedules are concerned, but these may not be any takers for the output. Such a beginning can bring disaster to an otherwise healthy organization. Therefore, the market must be prepared in advance, so that it is ready to receive and but the products/services offered by the newly commissioned project.

Thus marketing efforts, particularly those connected with advertising and distribution, must be initiated during the project execution stage itself.



As we have said at the beginning, a DPR is a blue print for action. Therefore, the DPR must also contain a section only the Marketing Strategy, touching on all aspects of the marketing function that needs to be carried out during the project execution phase as well as the operational phase. This should cover the overall approach, a discussion on strategic alternatives and possible choice, a marketing organization, and a schedule for various marketing activities.

i) The Product-market Posture

As you might be aware, from your studies of Marketing Management, no market, is homogeneous entity. Each market can and should be divided into as many segments as necessary so that each segment is distinct in its specific requirements, from others, while at the same time displaying requirements, from others, while at the same time displaying uniformity within. Such segmentation may be based on location or habitat of the customers like Rural, Urban and Metropolitan; or on the basis of the income level like middle class, upper middle class, upper class, or on the basis of their occupation/ profession like students, housewives professional managers, academician etc.

The estimated total market (demand) for the product/service must now be divided into each market segment. At this point of time, it is necessary to identify competition in each segment and assess their strengths and weaknesses. This may lead to the identification of some desired market segments where the project authorities might enjoy special strengths and the competition is weak. Such segments would be most logical choice for targeting. Should such happy circumstances do not present themselves, the project authorities must still make a choice of the market segments, they would like to enter. Choice of these segments would determine specific details and features, that the product/service must have and the corresponding marketing strategy to be adopted.

The next decision point would be to decide on a target market share in each segment, so as to attain the overall market share targeted earlier during demand forecasting. This would be a function of competition in each segment and the competitive strength that the project authorities wishes to build for themselves. This analysis also help the EPT (equipment and process technology) decisions, since the end product mix and their principal features get determined.

j) The 4 Ps

Armed with the segmented market share targets, it is now possible to design the Product/Price/Promotion and Place (distribution) strategies for the products/services. Product decisions would concentrate on special features, add-one, options and other product design parameters to suit the specialized needs of each targeted market segment. Pricing for each segment may also be estimated in advance. These estimates would form useful inputs for estimation of sales revenue required in the finance section the DPR.

The next important decision point concepts the distribution strategy for the product/ service. These decisions would in turn lead to the requirements for packaging materials and machinery e -d finished goods transportation and warehousing requirements. In case of a large number of industrial and household appliances, it would also include installation and commissioning of the product and after sales services.

The last but not the least, the promotional strategies each segment has to be chalked out. Most customers would not know by themselves, the emergence of a new supplier, as a result of the project undertaken. They must be informed. They must also be informed about the large range of products/services being/would be offered, their special characteristics and features and when and where would these be available. For new applications, users must be approached directly and new applications ideas must be pursued. For example, cycle manufacturers may be told the benefits derivable from stainless steel runs and their- technical problems for adapting stainless may have to be solved. A definitive promotional plan needs to be drawn up and included as part of the DPR.

k) Product Launch Strategy

Marketing experts often refer to the introduction of a new product into the market as a product launch. They devise a three step procedure involving i) test marketing in selected areas, ii) data collection and analysis from test markets and iii) final product launch. Detailed plans for the launch, including a separate network of activities are



drawn up for successful launching of a new product. The DPR may preferably contain a section devoted to the Product Launch Strategy and Schedules.

l) Marketing Organization

The DPR must now turn towards the organization for carrying out the necessary marketing functions during the Project phase and the operation phase, specialized one time activities like market survey etc. may be best entrusted on appropriate agencies. But the project authorities must retain some activities and *decisions* in its own hands. The marketing organization would be responsible for these decision, as well as, co-ordination with all the external agencies involved in the marketing efforts. At least one person (manager) must be in position from the very beginning. Further additions may be planned depending upon the schedule of marketing activities.

m) Marketing Schedule

The DPR should draw up a separate schedule for all activities related with marketing of the product. The network for new product launch would be a part of this schedule. It would include other activities like recruitment and induction of marketing executives, appointment of specialized agencies, printing of information brochures and leaflets, media selection for promotional activities, and so on. A well planned marketing schedule in the DPR is a must for the success of a project.

n) Other Marketing Options

The planners might, at this stage, also consider a few special marketing options. These include:

- Consumption within the same group of companies.
- Guaranteed buy back arrangements
- Exports

The first option is one of the easiest and one must not mix this opportunity.

In many instances, it may be possible to arrive at fixed or guaranteed buy back arrangements. In the more recent trend towards Just-in-time supply and much closer under relationship, a project may be conceived as a main supplier to a single major customer, with options to supply to other customers as well. This is the other side of vendor development. In such cases, however, the product decision mint be according to the requirements of the major customer and the EPT (Equipment and/Process Technology) must conform to these requirements.

Yet another tie up could be for exports. A number of mining projects in our country had export tie-up arrangements.

The market planning exercise should develop a product-mix, installed capacity, progressive capacity utilization targets and a strategy and organization for achieving these objectives.

Activity 7

"Marketing Planning forms the cornerstone of any project formulation we should never go in for a project for which customers and their demands have not been identified." Examine the statement and bring out strong justification of marketing planning.

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5.4 EQUIPMENT AND PROCESS TECHNOLOGY

a) Overview

The market planning section laid down the product-mix and the installed capacity requirements for a project. It is now time to devote our attention to the design of facilities, that would be able to produce and deliver these products

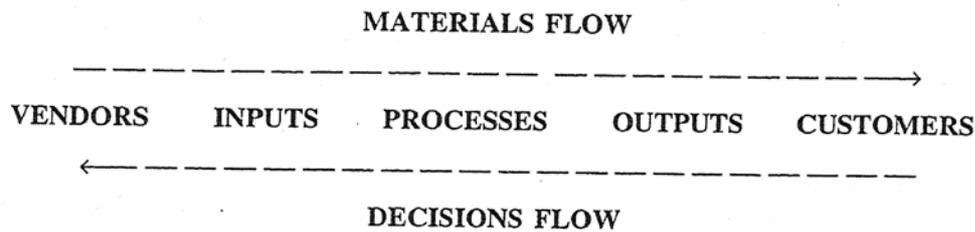


Fig. 1

services of the required quantity and quality. This exercise is broadly termed as the EPT (Equipment and process Technology) decision. In order to understand the nature of this exercise, it may be helpful to have a very broad and general framework for discussion. Fig. 1 depicts a general transformation systems, in which vendors supply certain inputs, These inputs are processed to add value of them, and are then supplied to customers materials flow from vendors, through the processes, onto the customers. EPT decisions are concerned with the design of this entire chain. These may, very broadly be classified into

- Output decisions
- Process decisions
- Inputs decisions
- Transportation & Storage decisions.

Note that these decisions are listed in reverse order of materials flow. This is depicted by the decisions flow arrow in fig. 1. This indicates the logical relationship between these decisions.

The market planning section has provided us with the output decisions. The EPT section must provide the remaining three decisions and a plan for their execution.

The inputs and process decisions have an element of complementary built in. Together, they may be said to represent major "make or buy" decisions. A very wide choice exists between making almost everything required in-house, to subcontracting out all components and sub-assemblies to outside vendors, and keeping only final assembly and testing within the project facilities. Normal solutions usually fall in between these two extremes.

These decisions are usually governed by the strategic considerations, leading to a focus on selective competencies. All items requiring the application of sophisticated technologies are retained as 'make' items. In contrast, low technology, commonly available items tend to be subcontracted out, to derive cost advantages. Attempts are also made to identify high value addition items and retain them for in-house processing. Yet another consideration is the entry barrier. Items with low barriers to entry are usually earmarked for buying, whereas, other items with high barriers to entry, are retained within. In this manner, attempts are made to build in an element of strategic competencies within, so as to forestall future competition, as far as possible.

All of such considerations are dependent on the overall state of technological development within the country and the region, where the project is, likely to be set up. One has only to compare the design of projects during the 2nd and 3rd Ave year plan periods, with those in the seventh and eighth plan periods for similar industries, to see this effect. Earlier plants tended to be far more integrated, since the availability of suitable vendors was extremely limited. Simple traditional machining facilities also, had to be provided in house. Now-a-days, fairly complex components and sub assemblies can be easily bought out.



b) Choice of Technology and Appraisal

The make or buy decisions lead to the finalization of various inputs and their processing and assembly requirements. The next technological decision concerns the choice of technology for these processes. In the ultimate analysis, this choice may be seen as a choice of the mix of capital and labour as the two principal factors of production. A certain degree of substitution is possible, between capital and labour. Modern high tech. equipment and processes are usually more automated, require much less labour, but are more costly. On the other hand traditional equipment and process are less automated required more labour but are less costly. The trade-off lies between high capital and low labour cost on the one hand; and low capital and high labour costs on the other.

In addition to factor costs and their relative proportions, other considerations like scale of operations, quality and level of skills required, also influence the choice of technology decisions. Depending upon the market share and capacity forecasts, a particular level of technology may be the optimum choice. High tech High volume EPT may not be suitable when the overall demand projections do not indicate such high volumes of consumptions. Non-availability of adequately skilled labour for operating and maintaining high tech equipment and processes have often led to sub-optimal use of such facilities. For example, modern machinery may have automatic lubricating system, with functional interlocks which automatically stops the machine, when the lubrication system fails. These have been instances, when plant authorities have removed such interlocks, when they were unable to maintain the lubrication system and still wanted to carry on with the machine operations, with a view to achieving production targets. Such short term measures cause irreparable damage to plant and equipment. These factors, coupled with the abundant supply of labour, has given rise to the concept of an "Appropriate Technology

Whenever one considers adoption of a relatively new technology, the question of its reliability comes up. The decision maker is eager to know the experiences of other users in the use of similar technologies. Are the claims made by the suppliers substantiated by actual users' experiences? Normally one has to look beyond the boundaries of one's own country, for such information. Reputed providers of new technologies often realise this need and provides the experiences of their other customers, specially if requested. This choice lies between the so-called "proven technology" and later developments.

The choice of technology is, therefore, a complex task, requiring a wide knowledge and information about different options and their advantages and disadvantages. These are to be matched with the skills and competitors available, desired scale of operations, the competitive posture of the enterprise. Finally, it is a well considered judgement only on the part of the project authorities, which decides this ticklish issue.

c) Technology Collaboration

The DPR has to consider the need for and sources of any specialised technical know-how for the project. For a number of modern technology projects, it may be necessary to have a technical collaboration agreement with some organization who have had considerable experience in the use of the same technology, and are in a position to impart their knowledge to others. Such a collaborating organization may be found within the country, but in most of the cases, one has to look for a technological collaborator, abroad.

Depending upon the chosen technology and the available/potential expertise within the project organization, the DPR might recommend the need for entering into a technological collaboration agreement. Once the recommendation is in the affirmative, it becomes necessary to elaborate it further.

The DPR must specify the broad objective and scope of the proposed collaboration. The ultimate objective would necessarily recalled full adaptation of the new technology by the project organisation. However, this may go beyond mere "know-why". It should also lay down the modalities for achieving these objectives. This might includes:

- i) deputation of experts by the collaborator to advise and assist the project authorities during Project Execution and Operation.
- ii) training of project authorities personnel at the works of the collaborator, including on-the-job training



- iii) transferring technical/process details in the form of documents; detailing out various processes, control parameters.
- iv) transferring Quality Control documents detailing out control parameters, procedures, organisation and responsibilities.
- v) assistance in the preparation of Operation and maintenance manuals.
- vi) exchange of research and development findings on a periodic basis.

Cost estimates for the technical collaboration programme should also be indicated in the DPR and included in the overall project cost. This might include some one time down payment, defraying the travel, stay and per diem costs for deputation of experts, some periodic payments tied up with the submission of know-how documents according to some mutually agreed schedule, and some royalty payment during the operating phase, as a pre-determined percentage of sales.

These estimates should clearly state the Rupee (home country currency) expenses and foreign exchange component of the total costs. Care must be taken to ensure that the payment terms for foreign technical collaboration agreements do not violate any pertinent regulations in this regard prevailing in the country.

After detailing out the broad objective, scope and the cost of the proposed collaboration arrangement, the DPR should also indicate some criteria for selection of a collaborator and a broad time schedule for competition of the collaboration tie-up. In most of such situations, when a technical collaboration arrangement is seen to be essential for a project, it is scheduled to be one of the first milestones to be achieved. In this manner, it becomes possible to obtain their advise some fundamental aspects of the project like plant layout, selection of main plant and equipment suppliers, training of project personnel, manpower planning, etc.

The DPR should establish a definite Equipment and Process Technology as the chosen, feasible option and outline the need for technological collaboration if any.

d) Equipment and Process Technology Retails

After laying down the broad choice of EPT, the DPR must now provide as much detailed specifications as may be required for actual tenders to be invited or the supply, (supervision of) erection, commissioning and guarantee tests of complete plant and equipment for the project. The totally of requirements may be broadly classified into the following categories:

- Main plant and equipment
- Materials handling and storage
- Packaging and distribution equipment and facilities
- Utilities like power, fuel, air, gases, steam, water etc.
- Pollution control and effluent disposal systems
- Services like canteen, medical, drainage and sewerage, roads, railways, offices, fire protection equipment etc.
- Township and related facilities i

5.5 LOCATION OF THE PROJECT

The DPR must consider this design issue and given its recommendation w.r.t. the location of the project. Basically, location decisions may be divided into two basic options: inputs or supplies oriented or outputs or market, oriented. In the former option, the major considerations governing the location decision concerns the availability of various inputs for the project and their transportation from the respective sources to the project site. Whenever a project entails processing of bulky raw materials and the processing reduces the bulk by refinements/processing operations, it makes economic sense to move the project nearer the supplies, so as to cut down on transportation costs. The strategy of National Thermal Power Corporation to locate major pit head thermal



power plants stems from this logic. Instead of transporting coal over long distances, it may be more economical to convert coal into electrical energy, at the pit head itself, and then transmit the electrical energy through high voltage transmission systems to consumption centres. With the advent of High Voltage Direct Current (HVDC) transmission technology, such options have become more cost effective. On the other hand, gas based power plants may be located nearer, the consumption centres, particularly if gas lines have already been laid near by, for other projects. This enables savings on the transmission line costs and power losses in transmission. The Dadri power project (also of NTPC) near Delhi is one such example, which took advantage of the HBJ gas pipeline.

As you might have guessed by now, the locational strategy is large by governed by total transportation costs for the entire chain, including transportation of all inputs from this sources, to the processing site and that of all outputs to the consumption centres. In fact, very standardized transportation models, which is a special form of Linear Programming model, can be applied to find out the optimum location, from amongst a set of other-wise suitable options. This exercise needs the sources and quantities of all supplies available, their unit transportation cost to each location and the demands at different consumption centres, coupled with the unit transportation cost of finished goods to each consumption centre, from each location.

Let us now turn to the other considerations that govern location decisions. A major element in this respect is the packet of incentives that various state governments and the central government offers, to induce industries to be located in backward areas, to promote industrialization and development of such areas. Such incentives may include exception from sales tax for some initial years, concessional rates of income tax, availability of land in industrial estates, assurances of power and water supplies, and so on. Investors on the other hand, all concerned with the availability of infrastructural facilities and proximity to markets. Since an entire district is usually designated as such a backward area, industrialization usually takes place at the fringes of such areas, that are contiguous with more advanced (industrially) districts, to derive the backward area benefits as well as the benefits available at more industrially developed districts. For example, the South 24 Parganas district was declared as a backward area, and it is located just south. of Calcutta, Industrialization has progressed on both sides of the Diamond Harbour Road connecting it to Calcutta, beginning from the immediate borders with Calcutta. The Siemens factory is one such early example.

This leads us to yet another important set of considerations that govern the location of projects. These include:

- The regulatory framework in the region
- Availability of skilled manpower
- Industrial relations situation
- Infrastructural support

Quite often the environmental control regulations differ from State to State and their enforcement varies from State to State. This is an important consideration for those projects which have significant detailed impact on their environment.

Many projects are dependent upon the availability of skilled manpower and repair services which are generally available only in industrialized regions. In case these specialities are not available, it becomes necessary for the project authorities to build in such costly facilities and skills within the organization. This may not be the most cost effective solution because the need for such specialized services are not very regular and may lead to under utilization of highly skilled personnel. In such cases, project authorities would like to locate themselves nearer highly industrialized belts so that they can easily draw up such services.

The industrial relations situation vary significantly from one region to another. Labour unions are known to be better organized and capable of strong collective bargaining efforts in the highly industrialized locations in the country. Any new project coming up in the vicinity of such areas would most likely attract similar union activities. This is an important consideration with the project authorities. If the authorities feel that the benefits of locating in an industrialized area are high and they have sufficient experience and confidence *in* managing the industrial relations, they may still decide to locate their industry in such an area. On the other hand, if locating an industry in a less developed



and, therefore, more peaceful industrial relations climate they might as well so. These aspects of the DPR are to a large extent influenced by the perceptions of the owners in these respects.

Many medium end large projects could require the services of professional managers who would be enjoying good infrastructural facilities like education for their children, housing, health care, recreational facilities, public transport systems and communication facilities. For any new project to be able to draw talented managerial and supervisory personnel it might be essential to ensure that equally adequate infrastructural support facilities would obviously be the winner.

5.6 LAYOUT OF THE PROJECT

The layout itself have profound implications on the profitability and efficiency of any enterprise. Even safety considerations can lead to major changes in layout. The layout for a project determines the location of various departments, processes, work centers, machines and service function as well as the transportation routes for movement of materials through these facilities. A good layout should try to reduce material handling cost to the minimum, ensure flow of men and materials between processes without any back tracking and or condition, provide adequate safety for men and equipment and enhance labour efficiency and a layout in the shape of a "U" pattern is one of the most favoured layouts since it facilitates communication between operators and provides an access to a number of machines. This is shown in Figure 1. Such layouts also provide certain degree of operational flexibility thereby helping in achievement of improved quality of work life.

Safety must be a very important consideration for deciding locations of potentially hazardous facilities. For example, storage facilities for acids and other hazardous items must be located as far away from the general center of activities as economically and practically feasible. Facilities which are prone to fire hazards should be located in a fashion that easy and quick multiple accesses for fire tenders are possible. It may be worthwhile to give a specific safety check to a layout before finalizing it. In an old plant which had not given due consideration to these factors a fire totally damaged two very important equipment simply because the fire tenders could not reach the spot easily.

5.7 MATERIALS BALANCE OF THE PROJECT CAPITAL

The DPR should provide an estimation of the total material balance for the project. This could include the quantities of all major material inputs for the capacity output. It would also specify various losses and bye products that may take place during handling and processing of these materials. It would also given the total quantities of each category of product which are expected at full capacity utilization for the project. This would obviously involve the application of certain norms for material losses and yields of different processes. The DPR should very specifically mention the assumptions with respect to these norms and the basis thereof. These standards become the first level targets for achievement before the plant operating agencies at the end of the project period.

5.8 SPECIFICATION FOR MAIN PLANT AND EQUIPMENT

You have noted in the beginning of this section that the DPR must provide detailed technical specifications for the purpose of tendering of all facilities that are required for the project. The specifications for the main plant and equipment, processing capabilities



of each equipment and the outputs expected thereof. In other words, it is a materials balance for a new equipment. The specifications should also include all the consumption norms for major services and consumables required like power, fuel, steam, water, compressed air, etc. and all costly consumables, POL items and chemicals. These consumption levels have an important impact on the cost effectiveness of an equipment and, therefore, it is very important to specify these norms at the tendering stage itself.

The specifications should also include the throughout or output rates and the overall annualized capacity of each equipment. The specifications should also include the emission levels for all affluent the gases and their composition which must be adhered to. These requirements are set in accordance with the environmental regulations prevailing in the region.

5.9 ENVIRONMENT IMPACT ASSESSMENT

The EPT chapter of the DPR must devote a separate section on environmental impact assessment for the project. Such an assessment would have the specifications of the environment which is known as the base level specification before setting up a project. Thereafter, an estimate should be made as to the impact of the project's operations on various base level parameters. These could cover air, water and soil parameters. For example, this might include the sulfur dioxide level in the atmosphere or flourine level for water in the surrounding area. With the disposal of solid, liquid and gaseous effluents generated by the project, it is expected that these levels would shoot up. After estimating the impact of the project on the base level of the environment the DPR should recommend specific control measures and effluent treatment facilities so that the environment can be restored to permissible limits.

For example, there may be provisions for installation of electrostatic precipitators for arresting dust particles, chemical treatment plants to neutralise toxic elements in fluids before disposal, installation of useful by-products plants, etc. Sometimes schemes for planned tree plantations may also help to mitigate the otherwise unavoidable impact of pollution. In special circumstances, when the industry deals with some particularly hazardous material, arrangements for emergency treatment, in case of accidental exposures should also be included.

The DPR must ensure that the provisions are adequate for fulfilling all the legal requirements obtaining in the locality where the project is to come up. This calls for a detailed knowledge of all the state level and national level provisions w.r.t. environment protection. Many of the provisions call for obtaining specific clearances from controlling bodies. The DPR should also include a time schedule for obtaining all the required clearances.

Detailing of EPT provides complete specifications for all equipment and facilities; ready for issuing invitation of tenders. They would also include guidelines for information to be obtained from equipment suppliers. The details should also specify the location, layout, material balance and environmental impact assessment for the project with reasons thereof.

5.10 OPERATIONS

a) Capacity Planning

One of the important considerations in formulating a DPR involves capacity planning. The marketing exercise provides the basic input for deciding the installed capacity requirement for the project which must be sufficient to cater to meet the demand for the entire spectra of the plant product mix. Starting from this point, the DPR tries to forecast a progressive build up on capacity utilization over the initial years of the operation of the project and targets an initial period of 3-4 years within which the facility must attain its final capacity utilization level. This progressive built up of capacity is then translated into the number of shifts of operation that is required of each



major plant and equipment. An attempt is made to economize on the number of shifts to be operated for each plant and equipment on the initial stages when the overall capacity utilization is not likely to reach its ultimate target. After arriving at this basic operational detail the DPR goes on to specify a broad requirement of manpower at different stages of capacity utilization.

b) Plant Organisation

The DPR also includes a recommended plant organization covering all functions at the three broad levels of management - junior, middle and senior. The issues concerning centralization versus decentralization are to be discussed and certain recommendations may be made in this regard keeping in view the technological requirements for successfully operating the plant facilities. Some of such considerations would involve maintenance functions. In a centralized maintenance set up all executive in the maintenance set up would come under one chief of maintenance, who would hold a position parallel in rank to the chief of operations. Both of them would be reporting to another top level executive. In a decentralised setup, separate unit level maintenance teams would be reporting to the operational head of that unit. There are advantages and disadvantages inherent in both the systems, and the designers should weigh them carefully, keeping in mind the nature of technology employed, and make a recommendation.

c) Personnel

The DPR includes a section on the overall personnel requirement for the project as well as the operation phase and a broad plan for recruitment, induction and training of required personnel. The requirement of all technical, skilled manpower is derived from the capacity utilization plan discussed earlier. Depending the number of shifts of operation required for each major plant equipment, utilities and support services, the DPR can give a phased requirement of skilled and supervisory manpower for the operations of the project. The requirement for managerial positions can be derived from the recommendation for a plant organization. While these forecasts pertain to the period of plant operation, the DPR should also indicate the organization at the project phase that may be necessary. The requirement of personnel on the project phase would largely depend on the extent to which direct supervision and management of the project is undertaken by the project authorities and the extent to which the project realize on specialists services from consultants and other consideration and erection specialists for project execution. Higher the number of services purchased from outside agencies, lower should be the requirement of having one's own personnel. However, it must be borne in mind that under no circumstances, the main control over time, cost and quality aspects of the project can be left to outside agencies. Therefore; during the project phase also the project authorities must have a bare minimum of project management executives entrusted with the responsibility for ensuring that these basic controls are not lost.

In many projects it is found that the large number of managers are required at the peak of the project execution phase. However, their need reduces as the project enters the commissioning and guarantee test phase while the requirements for managers to operate the facilities increases during the same period. It is, therefore, a good strategy to plan ahead for a transfer offer to some project personnel to move to operation, towards the end of the project execution phase. This becomes all the more important when the organization enters into a single large project and may not have another similar project to be handled after completion of the current project on hand. However, there may be a situation where an organization keeps on taking up a series of projects one after another. Under such situations it becomes preferable to build and retain the expertise in project management and, therefore, to, transfer project personnel from one project to another, instead of absorbing them in the operating phase of a given project. The DPR should take into consideration these features of the project organization and accordingly draw up a phased recruitment, induction and training plan for all categories of personnel required for the operations phase.

The phased recruitment and training plan takes into account the timing of the availability of personnel for the purpose of training and subsequent placement during the project and operations phase of a plant. For example, key maintenance personnel can benefit significantly through their association with the erection of the equipment, which they would be required to maintain later. Such an association provides an opportunity for a practical exposure to various components and assemblies of major plant and equipment



during their erection. Only a major shut down in future can provide a similar opportunity to have a close view of the equipment. On the other hand, operating personnel may not be required to have such detailed knowledge of the internal constitution of major equipment and it may suffice to have theirs at the beginning of the trial runs. This would enable operating personnel to understand the operating characteristics of the equipment from the very beginning. Such an analysis would lead to scheduling the recruitment of maintenance personnel well ahead of that of operations personnel.

Training of all key personnel is yet another important factor and sufficient care must be exercised of identifying the training needs of various categories of personnel and build these period in the recruitment plan so that people are trained before they are positioned to their respective assignments. Such training needs may include training inhouse, training within the country with some other organizations who are willing to accept the trainees, training abroad with the major equipment suppliers as well as with fine technical collaborators if any. A well planned personnel recruitment, induction and training schedule can help significantly in the success of the project.

The DPR would also include an estimate of the different salaries and wages to be paid for all categories of personnel and this would provide an input for estimating the overall personnel costs for the project. These costs would be included in the overall cost estimates for the project.

d) Operations Planning

Any new project is very much similar to the setting up of a new household. Very simple items like salt or a scrubber need to be purchased before a new household can start functioning. Similarly, the operation of any new project would require a large variety of different items like minor consumable, stationary and safety related items which must be procured in order that the project facilities can be smoothly run. The DPR should devote a section on operations planning to recommend an organized approach for carrying out the operations planning exercise so that all trifling and minor items are available for the operation of the facilities. Experience with a number of projects show that a small cell managed by one or two persons can be entrusted with the operations planning activities while the project is still under execution. This provides the project authorities adequate time and a guarantee that nothing will be missing at the time of operations. This cell would first of all list all supplies and consumable required for the operation of all plant, equipment and services. They would try to identify the different sources of supply for each of such items - the reliability of the source, their delivery time requirement, quality and the cost. Based on these efforts, this group should place orders for the first supply to match the commissioning schedule and follow up with all the suppliers to ensure timely availability of all items.

While the DPR cannot lay down the details, it must emphasize a need to initiate actions for operations planning and indicate a schedule for carrying to this activity parallel with the project execution.

e) Vendor Management

All the items which are decided to be purchased inputs for the final product/services to be offered by the project needs vendor management functions. The DPR must provide guidelines indicating items where existing supplies can be relied upon and identify those cases where it would, be necessary to develop new vendors. For new vendor development, the DPR might touch on such important issues as the need for know-how transfer to the prospective vendor, equity participation in the prospective vendors project, method of quality control on the prospective vendors supplies delivery schedules, pricing of supplies and funding support, if any by way of facilitating term loans from financial institutions. In case of a project in which vendor development occupies a very critical role (for example a new automobile project) the DPR should also outline the organizational requirement for vendor development. The DPR should also provide guidelines for implementation of the vendor development strategy and its proper maintenance. This might include guidelines for the degree of coordination necessary with the vendors, more of information sharing with the vendors and approach to obtain synergy in the efforts towards vendor development.



f) The Quality Strategy

The operations section of the DPR should also touch upon the quality strategy to be adopted by the project authorities. This might include a statement of the basic approach, to quality and go on to include ways and means to ensure the quality of all supplies, in-house process and distribution and after sales service management. It must be emphasized that in the hectic schedule of project execution and the initial days of commissioning, guarantee test and the thrust towards achievement of capacity utilization targets, quality very often takes a back seat. With the primary emphasis on quality targets quality may even be neglected and some undesirable operational practices lead to inferior quality may come in vogue. Once such wrong operating practices find a place within an enterprise, it becomes very difficult to correct them and to introduce good practices later on. It is, therefore, very essential to have a quality strategy from the very beginning and stress the use of quality approaches from day one. This might also involve training *all* categories of personnel in quality including those involved in operation, maintenance and services at different levels. The principles of Total Quality Management and quality responsibility with direct operators need to be stressed from the very beginning to be able to derive the best advantage from such systems.

The DPR should, therefore, devote a section on the quality strategy to be followed by the project personnel, the training needs and the need for emphasizing quality in **all** facts of the function of the project at the operating stage.

g) Operations Costing

The DPR should provide considerable details on the costing of the operations at different levels of capacity utilization. Fairly accurate estimates of expenses on account of input materials, labour, power, fuel, POL and other direct expenses should be provided in the DPR for each line of product mix. The DPR should also give fairly accurate estimates of other marketing, administration and other overhead expenses.

h) Management Information System (MIS)

The DPR should devote a section on the recommended outline of an MIS to be adopted for the operating system. The basic recommended approach for MIS should be explained. If any computer facilities are required, the hardware and software specifications should be laid down, the areas for computerization may be identified, a suitable organization for management information systems may be recommended.

i) Safety

Safety must be given adequate weightage in the DPR. All processes/areas which have potential hazards must be identified; overall approach for safety of personnel and facilities should be clearly indicated; safety devices for protecting of equipment/appliances from damage through accidents should be specified. This might include the provision of limit switches, automatic interlocks for stoppage of plant and equipment, automatic sprinkler system for preventing fire accidents etc. some vital installations like LPG storage facilities may require special automatic safety devices and the application of a strict safety regime to prevent fire.

The DPR should specify the general safety requirements to be followed by the suppliers of all plant and equipment and these conditions should form a part of the general conditions of contract in all invitations to tender.

The DPR should also discuss the safety requirements of personnel, recommend a safety organization and a safety training system for all concerned people.

j) Finishing

The DPR should devote a section specifically to deal with packaging, storage and handling, and despatch, of the finished products. This might include specification of the packaging materials, specialized packaging equipment, if necessary, handling devices for handling the finished goods, provision of warehouses for proper storage of finished goods and some thoughts on the modes of transportation for the finished goods from the factory to the warehouses and from the warehouses to the dealers/retailers. An organization for the delivery system and recommendations for encouraging the services of any specialized agencies, if necessary, should be included in the DPR.



5.11 COMMERCIAL ASPECTS

The DPR includes a section devoted to general guidelines and conditions that should govern all types of contractual relationships likely to be entered into, during the project. In particular, general guidelines for any eventual arbitration procedures are indicated, specifying the nature of issues that may be referred for arbitration, choice of the arbitrator by both the parties, and the place where such proceedings should be held. You might recall the Enron case, wherein it was a part of the contract that arbitration proceedings could be held in London, and arbitrators must be chosen from a third country, meaning that they cannot be citizens of either India or the US.

A number of general conditions covering the supply, (supervision of), erection, commissioning and guarantee tests of various equipment for the project need are drawn up. These terms and conditions must get inputs from technical as well as commercial departments. The DPR provides certain guidelines in these respects. An important issue may be the general procedure to be followed in the tendering process: like single stage or two stage tendering. It may contain a model invitation to a tender (ITT) document that specifies the inclusion of the following items, in all bids for the supply of major plant and equipment:

- 1) Recommended manpower requirement for operating and maintaining the equipment
- 2) Operations and maintenance manuals
- 3) Specific confirmation regarding adherence to all specifications laid down by the purchaser
- 4) indicative load data and schedule of providing firm load data
- 5) Schedules for supply/delivery, erections and commissioning: and a periodic progress reporting system
- 6) Operators skills requirement
- 7) Training facilities offered by supplier
- 8) Experience of previous supplies

Generally the invitation to tendered documents are prepared separately for the following categories of contracts:

- 1) Supply of plant and equipment
- 2) Supply, supervision of erection, commissioning and guarantee tests
- 3) Supply, erection, commissioning and guarantee tests
- 4) Erection and commissioning of equipment
- 5) Civil and structural work at site

For all major vendors the terms cover supply only whereas for most of the major plant and equipment the terms cover supply, supervision of erection, commissioning and guarantee tests. For specialized equipment which can only be erected by the supplier themselves, the terms include supply, erection, commissioning and guarantee tests.

Some of the important issues that may be touched upon are listed below:

- Commitment w.r.t. delivery period and penalty conditions, in case of a failure to fulfil the commitment
- General terms of payment, including progress payment
- Inspection and testing procedures, and customer hold points
- Network plan for the contract, and monitoring and control system
- Guarantee test: schedule, procedure, criteria for success, and accompanying Bank Guarantee
- Responsibility for damage in transit, or during erection and/or commissioning
- Conditions for admissibility of any increase in the price of the contract



- Contract variations and the manner of handling them
- Mobilisation advance (if any) to be paid initially
- Responsibility to supply the "first fill", and spare parts for the first few years of operation

The guidelines w.r.t. the commercial aspects contained in a DPR can save a lot of problems from dragging on and adversely affecting the execution of the project.

5.12 FINANCIAL ASPECTS

The DPR incorporates a much detailed projection of the costs and revenues expected during the projected lifespan of the operation phase. The principal input to this comes from operations Cost. However, all financing costs, like depreciation, interest on long term loans and short term working capital loans, writing off of pre-operative and preliminary expenses, guarantee commission etc. are included in the calculations. Income Tax calculations are also included. The DPR provides projections for:

- The Profit & Loss statement
- The Balance Sheet
- The Fund Flow statement for about ten years of operations.

For the Project phase, the DPR provides an estimate of the phased requirement of Capital. This plan forms the basis of a strategic plan for raising the funds from external sources, like term lending institutions and through public issue of stocks and/or bonds. The DPR would include a recommended schedule for ensuring adequate flow of funds for the timely completion of the project, with adequate provision for normal contingencies.

The DPR would also include for the project phase a recommended system for the monitoring and control of the financial progress of the project, vis-à-vis the physical progress. This system is, an essential ingredient for adequate financial control, during the execution and the termination phase of the project.

5.13 SOCIO ECONOMIC ASPECTS

Till recently, very little attention used to be paid to the Socio-economic impact of a project on its immediate surroundings. However, as the experience throughout the world shows, the attitude of the local residents where as new project is slated to come up, sometimes play very crucial role to the successful completion of the project. Generally, a moderate to large project causes some displacement of the original tenants of the land, brings in significant change in the pattern of earning livelihood, brings in wide disparity in the standards of living between those who are employed in the project and those who are left out of it, raises large employment expectations among the local populace large employment expectations among the local populace vis-à-vis employment potential, and very soon leads to large scale disappointments. The effects are more glaring, bigger the size of the investment, higher, the level of technology used, and greener the pasture, where it is set up. Different combination of these effects may be present in a particular project. However, any such combination of impacts provide a fertile ground for the creation of a social discontent. The project is then seen as the root cause for all the turmoil, and its progress gets affected through different types of social unrest.

It is, therefore essential to make an effort at the early planning stage, to assess the area of population likely to be influenced by the project, carry out a demographic survey of the area to assess the potential for direct employment in the project, ascertain the overall nature of artisan training that could improve their employment potential, and seek avenues for the generation indirect employment for those who may not be provided employment directly. For example, some low skilled services requirements, like house



keeping, general area cleaning, scrap handling, and general labour contracts may be kept aside for sourcing from local external sources.

Simultaneously, the DPR may include some provisions for community development plans, like building of roads, schools, dispensaries, provision of drinking water facilities, street lighting etc. A large corporation has even gone to the extent of building rest shade for the horse drawn carts plying in the area.

While in most of the projects, such activities are taken up only after the problems surface, it is a good idea that the DPR gives some serious considerations to these issues. It should include an estimate of the expenditure for these activities, and some assessment of the benefits and/or absence of potential troubles that may be expected.

The World Bank funded projects are witnessing a definite requirement from the Bank that Socio-economic surveys are carried out both before and after the project. Many national level progressive lending institutions may follow suite. The earlier one adopts a proactive stance to address this issue, the better for the project. Possibilities of involving local bodies, NGOs etc. towards the assessment and implementation of these activities may also be explored in the DPR.

5.14 WHO PREPARES A DPR?

You must be convinced that a very wide variety of expertise are required for the preparation of a DPR. A number of decisions are mutually related. For example, requirement and training plan is dependent on the nature of the technology, availability in the general employment market in the region need for foreign collaboration and training, extent of specialised plant and equipment supplied for abroad, etc.

Financing requirements are dependent on the time schedule for the implementation of the project.

The nature of issues to be included in the commercial terms and conditions depend on the extent of the spread of the contractors. If only local and regional parties are in picture, the scope and jurisdiction for disputes get restricted.

A number of issues depend largely upon managerial perceptions and top management policies.

On the whole, preparation of a DPR is a complex task. Therefore, highly specialised agencies have come up in different areas, who undertake such tasks for clients. They are usually known as technical consultancy organisations. They specialise in some particular field. For example, Dasturco specialises in metallurgical industries. Engineers India Ltd specialises in the oil sector. Even for a medium sized project, it is necessary that a capable consulting firm is entrusted with the task of formulating the DPR.

The process usually take the following shape:

- The client enters into a contractual relationship with a consultant
- The consultant receives all inputs from the client, carries out necessary studies, and submits a first draft to the client
- The client evaluates the draft, makes extensive `comments, suggestions and requests for modifications/further studies by the consultant
- The consultant submits the revised draft for approval
- The consultant subunits the final DPR; after approval from the client, with all the details as Appendices and Annexures.

5.15 EVALUATION OF DPR

The final responsibility for a project lies with the owners. Therefore, the owners organisation must have an appropriate mechanism for proper evaluation of a DPR (draft



or Final) submitted by a consultant. Apart from care in selecting a suitable consultant in the first place, the owners may pose the following questions:

What are the sources of critical data and information that have formed the basic premises of the DPR, like, demand, capital costs, input costs, technological alternatives, etc.

The extent to which the strategic plans of top management have been reflected in the design

What were the various alternative considered, and the methodology followed for choosing one among them

The extent to which the design fulfils all applicable statutory regulations, both currently in force, and those that may be foreseen

Identification of potential problems, bottlenecks and/or major risks involved in the project.

Influence of complementary/completing projects

Degree of detailing

Scope for future expansion/modifications/adaptation to new technologies, etc.

The above list is a sample of the types of questions that the owner may pose to the consultants, during the process of selection, appraisal of the first draft, and before giving final approval.

Activity 8

Quality of Design Planning that goes into the Detailed Project Report directly impacts on the quality of implementation and operation of the project. Elaborate the important role of design phase in all human endeavour.

5.16 SUMMARY

Detail Project Report (DPR) in a very detailed and elaborate plan for a project' indications overall programme, different roles and responsibilities, and activities and resources required for the project. Market planning sections of DPR must cover the demand forecasts for the goods/services. Data collection either by primary source on secondary source is most important in planning stage.

Process technology and choice of equipment are vital in project management Choice of technology requires a wide knowledge and information about different options and thins advantages and disadvantages. DPR must consider the location of project depending on the input availability and output deliverability. DPR gives details about the project layout specification for main plant and equipment, processing capabilities of each equipment and the output expected thereof. Environment impact assessment would have the specifications of the environment which is known as the base level specification before setting up the project.

5.17 SELF-ASSESSMENT EXERCISES

- 1 "Decisions made during the design phase have major impact on the entire life cycle of a project". Justify with reasoning.
2. "Projects should be formulated primarily to meet the needs and wants of customers". Highlight the importance of market analysis in project management.



3. "Choice of winning technology has become extremely important in the emerging scenario of global competition". Explain with examples of good and had devices of technologies.
4. Bring out the importance of site selection for a new project. Is it an economic or personal issue?
5. "Doubled Project Report (DPR) forms the foundation on which the entire superstructure of the project is built - if it is weak, project cannot weather the turbulent times ahead." Bring out the do's and don'ts of a good DPR.

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