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# UNIDO MANUAL FOR THE PREPARATION OF FEASIBILITY STUDIES FOR SMALL ENTERPRISE INVESTMENT PROJECTS

PROPOSAL

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## INTRODUCTION

### Objective and Scope of the Proposed Outline (background information)

**Objective:** the Manual is intended for investors, entrepreneurs, financiers, consultants, as a guide for the preparation of investment projects for small and medium enterprises.

**Subject:** The Manual shall deal with the preparation of projects with investment costs ranging from US$ 50,000 to US$ 500,000 and for a size of firms with 20 or more persons engaged.

**Scope and Structure:** The proposal shall include a detailed outline of the contents of the Manual and brief substantive descriptions.

Part 1:

As to the organization of the proposed Manual - as per agreed outline - it shall deal in its first part with the preparation of opportunity and pre-feasibility studies, further to be detailed and described in the respective sub-chapters.

Part 2:

The second part is to contain the detailed aspects of the preparation of feasibility studies proper, related specifically to small and medium-sized investment projects and shall serve as a kind of 'blueprint' for entrepreneurs and/or investors, typically represented by an institutional intermediary, a bank, or another specialized agency. Relevant cross-references, wherever appropriate, shall be made to aspects and chapters of the pre-feasibility part to show how these tie in with feasibility studies and how they complement each other.

A special 'reference case' is to be incorporated for illustrative purposes.

## A) OBJECTIVES AND CONCEPT

The proposed Manual for the Preparation of Feasibility Studies for Small Enterprise Investment Projects addresses the need for a tool for the preparation and evaluation of projects in the small and medium-sized business sector, primarily in manufacturing. It will be designed along the lines of the already existing manuals for the preparation and evaluation of larger industrial projects and investments concerning however the characteristics and needs of small and medium enterprises.

So far, a similar guide for small and medium-sized firms has largely been missing. This, despite the widely acknowledged fact that a stable and sustained economic development needs a well structured manufacturing sector, comprising a healthy mixture of small, medium, and large firms.

### Characteristics of Small Scale Enterprises

While larger industrial enterprises tend to be capital-intensive due to large scale and relatively inflexible production processes, smaller firms use more labour-intensive production processes and show in general greater flexibility catering rather for local markets and demand patterns.
Smaller firms moreover tend to interrelate with large industrial units be it as suppliers or as customers or providing related services to common customers. Apart from such interrelations, there are additional spillover effects of mutual benefit with respect to, e.g., technical infrastructure, formation of human capital and diversification of business in general.

Industrialization in Europe over the nineteenth century in that sense may stand as an example which greatly has been fostered by a growing and well diversified structure of small and medium-sized firms and their know-how. That particular infrastructure continues to play a substantial role and constitutes a strong and indispensable basis of Europe's industrialized economies as is generally well recognized.

This experience can be seen as an indicator that development of the small and medium sized business sector is a key factor for developing countries too.

Heterogeneity, diversity, and the sheer number of individual small and medium-sized firms on the other hand limit the possibilities of coherent planning, promotion and control of development, thus requiring more flexible methods and procedures, adopted and geared to the specifics of that sector.

The need for a "new", specific manual for the preparation and evaluation of investment projects for small and medium sized enterprises arises from the outlined differences if compared with large scale industrial projects. They necessitate a different procedure and special features of such a manual, which will be described in greater detail in the following outline.

## Investment projects for Small Scale Enterprises

Pre-investment studies for projects of small scale industries will refer mainly to the establishment of such enterprises. Most other investment decisions of small enterprises, like replacement, modernization, et alia, will be based on "good judgement" of the entrepreneur and simple projections of financial cost-benefit ratios and demand. The size of such investments usually does not allow for more thorough feasibility studies.

For the foundation of small scale enterprises the cost of pre-investment studies will be, in general, too large to be borne by a single project. Therefore, this Manual proposes to prepare opportunity and pre-feasibility studies for well defined "typical" and repeatable investment projects. Promotion of these studies (e.g. by development and finance institutions) could then spread the cost over a number of projects. The potential investor who is, because of a favourable pre-feasibility study, interested in implementing a concrete project would need a feasibility study. However, most of the data assessed for the pre-feasibility study would still be valid and only a limited number of project specific data would have to be determined and included in the analysis.

This would require that the structure and contents of pre-feasibility and feasibility studies would have to be standardized and part of the necessary input (basic data) for pre-feasibility and feasibility studies would have to come from data banks. Such data banks could be developed by proper research institutions when executing pilot projects or pre-feasibility studies.

The availability of such data and a harmonized procedure for project-related pre-investment studies would reduce the related cost and support implementation of programs for development of small scale enterprises.

The respective data banks would be available at the small business research unit, where they are to be established and kept up to date, in close cooperation with the development agencies and financing institutions.

## Relevance of institutional setting for small and medium sized firms

The institutional framework of an economy may be taken as an indicator of development: the more developed a country, the more diversified and densely distributed (in a geographical sense) are its institutions. These institutions serve mainly as an instrument to implement government's development policies, as well as mediators in case of conflicts between individual interests and overriding concerns and decisions at regional, national or overall socio-political levels.
For example: representation and channeling of similar tasks and interests - e.g. on sectoral basis - may be considered a typical function in that context: taking on common tasks on behalf of individual clients or members in a cooperative manner rendering jointly required services; channeling of information; preparing and translating as well as participating in the formulation of relevant political decisions; etc.

It is obvious that the need for institutional services increases the more diversified and smaller the individual units are.

## The role of entrepreneurship

Entrepreneurship can be viewed as central for the dynamics of development and it is the more important and crucial in the case of small and medium-sized firms, where the role of the entrepreneur quite often is that of an investor, manager, financier and owner in one; being more or less involved in the normal day-to-day operations. The entrepreneur in that sense represents not merely a capitalist type ownership but typically becomes the 'center of activity.' The entrepreneurs profile or personality, his professional skill (management in general, organizational, commercial, technical, .....), and his professional experience will be key-elements, which will practically determine success or failure of an investment project.

Whereas technical and managerial skills are being viewed as learnable, transferable, and teachable, entrepreneurial skills are to a considerable extent associated with individual drive and talent. More recently however, attempts are being made to identify specific entrepreneurial skills on a rational basis and to develop respective curricula for teaching programs for future entrepreneurs.

An entrepreneurially conducive climate in a given economic and social setting, a proper 'entrepreneurial culture' or tradition no doubt influences individual attitudes and decisions vis a vis entrepreneurial involvement and an 'entrepreneurial class' in general.

Associated with a well entranced tradition of entrepreneurship are certainly a diversification of related skills, which constitute a kind of immaterial economic asset not only for the individual but also for the economy. These immaterial assets or human capital are essential catalysts for fostering future entrepreneurs and economic development in itself.

## Environment

A business environment that fosters enterprise development, is characterized by a multitude of factors: e.g. market regulations, access to the market, financial markets, institutional aspects, infrastructure, government practises, image of entrepreneurial activity, social security, access to financial, human and technological resources and services.

In most developing countries as well as in many industrialized countries industrial development policies or plans concentrate on large business. The formulation of development priorities and the definition of growth-areas is undoubtely important for the distribution of resources and for the selection of investment projects. Opportunity and pre-feasibility studies would first of all provide necessary information for formulation, evaluation and revision of these development priorities.
While development plans may address the need for stimulation of the medium sized firms, pre-investment studies for related projects are hardly ever conducted.

The cost for sufficiently detailed pre-investment studies as related to the investment cost for such projects are usually viewed as too high. If it is acceptable that opportunity and pre-feasibility studies for small projects in the range of US$ 50.000 to US$ 500.000 be prepared so as to demonstrate feasibility characteristics of typical and reproducable investment projects, the cost of these studies would be spread over a number of similar projects. Considering their nature and objectives these studies would also have to refer to more general, however related objectives of industrial development including sectoral and regional development aspects.

Each pre-feasibility study could, thus, cover a number of projects with similar characteristics, previously identified and analyzed in an opportunity study.
The projects however, would have to be sufficiently homogeneous to justify such a concept for the preparation of the studies.

Opportunity and pre-feasibility studies will allow institutions established for development of the small enterprise sector to define investment projects and to support preparation of feasibility studies for concrete single projects in cooperation with potential investors and entrepreneurs. Cost restrictions will in most cases require that these feasibility studies be conducted at the local level (probably and mainly with local experts.)

## B) OUTLINE OF THE MANUAL

### Introduction

The introduction of the Manual will contain general information and considerations as included in this report under A), such as

- -characteristics of small enterprises
- -investment projects for small enterprises
- -relevance of institutional setting
- -the role of entrepreneurship in small firms
- -environment

The introduction shall point out the basic differences between large and small projects, define the technical terms as used in the Manual and introduce the reader into the design, objectives and concept of the Manual.

### 1. Opportunity and pre-feasibility studies

#### 1.1. Opportunity studies

The search for business opportunities is normally the starting point of any entrepreneurial activity. Depending on the stage of development of a country relevant expertise and information for the identification and definition of business opportunities may be limited very often. If this is the case institutional support through appropriate agencies would be required. Investment opportunities may be found along the lines of development plans supplementing these plans or new opportunities may be determined, leading to plan revisions.

Because of the purpose and nature of opportunity studies, information or data to be incorporated with the study would reflect the general technical, financial and economic aspects of a business sector rather than a single enterprise's project.

Relevant and important parameters to be incorporated when preparing an opportunity study are for example:

-Definition of national/regional development goals,
-Definition of strategic objective of the project,
-Overall demand and market patterns (import-substitution, export),
-Availability of project input:
labour, know-how and human capital;
raw material, technology;
linkages and interrelations with other industries and/or sectors, distribution channels and marketing outlets (domestic and/or international), integration with existing industries.

For the evaluation of a project idea (opportunity) it will also be necessary to include certain macro-economic data (ratios, etc.) as, e.g., income levels, per capita consumption, etc.

Opportunity studies concentrate more on general business situations related for example to regions, subsectors, resources and overall net gains; therefore, they will be sketchy and have to rely mainly on aggregated data and general propositions rather than an in-depth detailed analysis.

Opportunity studies are prepared for a first screening and evaluation of investment ideas and proposals. They would serve to determine whether a development or planning institution should go ahead with pre-feasibility studies and whether potential groups of investors are likely to be interested in implementing individual projects.

Objectives and contents of opportunity studies for small projects differ - to some extent - from those prepared for large scale industrial projects. For example labour-related questions like available expertise or human capital in general, the institutional infrastructure and the availability of business services will be of greater importance for small sized investment projects than for large industrial projects. In the small enterprise sector locations are predominantly consumer oriented. Supply functions for local markets as indicated by average number of inhabitants per enterprise and per employee, or average spending per inhabitant for related products or services are not only basic indicators for existing opportunities but also suggest possible locations and possible number of specific projects, already at this stage of the analysis.

## 1.2. Pre-feasibility studies

Opportunity and pre-feasibility studies for small investment projects would be prepared and sponsored by development organizations. The studies would describe and analyze typical (standard) projects which should be reproducable.

Pre-feasibility studies for small investment projects will address a range of similar propositions (based on a specific and concrete project idea) rather than an individual project. It may include ratios and overall cash-flow projections rather than detailed break-up of cash-flows from investment and operation.

Pre-feasibility data and results are later to be incorporated and specified in the feasibility studies proper; therefore, pre-feasibility and feasibility studies shall in principle be structured along the same lines. They would mainly differ with regard to the data sources.

## 1.3 Contents of a pre-feasibility study

### 1.3.1 Executive summary

The results of the pre-feasibility study should be presented for convenience of presentation in an ececutive summary. The summary should contain all the basic issues, including conclusions, evaluation of alternatives and discussion of critical aspects in a condensed form. It will serve as a quick reference for potential investors, entrepreneurs and local agencies.

The pre-feasibility study should arrive at investment cost estimates within a margin of error of about +/- 15 to 20 % and provide the entrepreneur, investor and/or promoting agencies with checklists for the feasibility studies.

### 1.3.2 Project description

The project description should contain the backgound and project history and all the basic features of the project(s), especially:

- type of industry, products
- technology
- target groups (customer profile, demand patterns)
- size or range of investment.

The project description should also include basic information on the important macroeconomic variables: descriptive data on the economy as a whole as well as of the respective sector such as average size and regional distribution of firms; aspects pertinent for the overall entrepreneurial climate including organizational structure of the economy and socio-political conditions; degree of institutionalisation and decentralization of such infrastructure on regional and local levels.

Case study: a case study - as aggreed - shall exemplify the contents and structure of pre-feasibility and feasibility study. At the end of each sub-chapter references will be made to the (theoretical) 'case' in order to show how the 'theory' shall be translated into real figures.

### 1.3.3 Market and plant capacities

Estimates of demand and market size; sales promotion, marketing strategies, including device of distribution channels. Design of production programme and plant capacity with estimates of alternative investment cost (with a view as of such pre-feasibility being operationally applicable to a range of similar projects).

Estimates could be expressed either as amounts (from .... to ....) or as ratios as for instance spendings per household or per inhabitants per enterprise.
References could be made to minimum requirements (e.g. minimum plant size). Possibilities of joint arrangements and cooperative efforts in such areas as sales promotion and marketing may also be explored.

(Case study.)

### 1.3.4 Material input

Comprising in particular raw materials, semi-finished and finished products; possible substitutes; domestic and/or international availability; price structure and forecast of price-developments; quality aspects, consistance and reliability of supplies; related transport cost; storage facilities (cost, building requirements, etc.)

(Case study).

### 1.3.5 Location and site

The main problem areas to be covered by this chapter are:

* Possible alternatives of location:

- spatial and regional considerations with special regards to geographic conditions as well as to markets, marketing strategy and distribution.
- conditions and/or availability of technical infrastructure
- transport facilities (roads, train, and other traffic connections,communication access (mail, telephone, teleprinter) and existence of business related institutional infrastructure.

* Building related cost:

- cost estimate of required land and site preparation
- cost estimate of provision of necessary additional infrastructure
- building permit
- potential environmental impact and restrictions
- legal provisions and expenses
- building related tax considerations (incentives, subsidiaries, etc.)

* Construction and maintenance:

- availability and experience of contractors
- availability, quality and cost of building materials
- cost of construction

* Plant organization:

- flow of materials (including storage facilities for raw materials, half-finished and finished goods)
- organization of production, administration and sales (distribution)

(Case study).

1.3.6 Engineering and technical aspects

This chapter comprises mainly the following problem areas:
- choice, availability and cost of technology and equipment;
- technical design of plant, machinery, etc.; necessary technical infrastructure facilities (energy, water, waste deposal, sewage, including related ecological considerations and provisions);
- construction and building requirements.

These issues vary strongly by type of industry. Therefore, any manual addressing the small business sector in general can not be too specific. However, the proposed Manual shall not only provide checklists and advice on the procedure of selecting appropriate technologies but also enumerate sources of information available locally, regionally, nationally or internationally.

(Case study).

### 1.3.7 Manpower and expertise

Distinctly different from studies for large industrial investments this chapter should include the "entrepreneurial" requirements. This refers to the entrepreneurial qualities as well as the managerial and technical skills which a potential entrepreneur will need for the successful implementation of respective projects.

Overall description of manpower requirements:
- requirements of technical and managerial skills
- specification of personnel required by level of expertise

Availability of manpower and formation of skills

- Existing expertise and available skills (local, regional, national and international);
- schools and training facilities.
- On the job training systems and facilities.

Labour cost
- on related corporative levels (relation to average income; legal provisions)
- related cost: taxes, social security, benefits, pension rights, etc.
- necessary facilities

(Case study).

### 1.3.8 Project implementation and financing

Project implementation refers to the period between the decision to invest and the start of commercial production. This part of the Manual will deal with the design of a time schedule for the implementation phase. This should include the financial requirements at each implementation step.

In this context it will be necessary to discuss different sources of finances and the flow of finances needed to float the project until and beyond the start of production.

(Case study)

### 1.3.9 Institutional infrastructure

The importance of an efficient institutional infrastructure especially for the small and medium-sized enterprises can hardly be overstated; therefore, this aspect requires particular and careful attention at whatever level, be it local, regional or national.

This refers to organization as well as to regional structure of trade unions, employer's organizations, chambers of commerce and related business associations, relevant administrations, political and social bodies, as well as financial institutions, scientific and economic research institutes, etc., which may be relevant for the feasibility of the investment project.

Such institutions would be possible intermediaries or administrators for the promotion and control of small or medium-sized projects. In many cases these institutions may be involved directly or indirectly in the decision making process and in fostering or coordinating the pre-feasibility studies proper.

A properly designed Manual would be a particularly valuable guide to streamline and rationalize the procedure of project preparation and evaluation.

Apart from this possible function the institutional infrastructure provides necessary inputs, services and know how.

Overview:

The most important public institutions at the national level are

- planning offices,
- national development banks,
- the competent authorities in the ministries of science, research, education, finance, industry and trade, construction, traffic, social affairs, etc.

Semi-private and private (cooperative) institutions are for instance: trade and labor unions,
chambers of commerce and trade and their relevant service institutions (consulting, promotion),
cooperative financing institutions,
export/import cooperatives,
producer and consumer cooperatives,
educational institutions (education/training for adults, professional schools),
private services (consultants, commercial houses, transport, business and legal services, etc.)

Of course, not all institutions will be represented on the local level; the necessity for their local representation will depend on the nature of the project as well as on the frequency and intensity with which such services are needed.

Pre-feasibility studies should, due to the proposed Manual, deal with the institutional infrastructure mainly under the following aspects:

- necessity of specific services for the specific type of industry (region, business size, etc.);
- availability of these services;
- quality and price of these services (including cost-benefit estimate).

(Pre-feasibility studies - and the Manual - should not be expected to deal with setting up such institutions nor with small business-policies and programmes as such.)

(Case study).

### 1.3.10 Financial/economic evaluation

An integrated approach requires that projects are evaluated not only on the basis of a financial analysis, but also include effects on the social and economic environment. Therefore, the macro-economic evaluation shall be included in this chapter of the pre-feasibility study, to show possible effects for the economy of a region or sector, when a number of individual projects of that type is implemented.

Summarized market data and related cost estimates, showing the projected streams of project (investment) expenditure with cash-flow projections; estimates on annual production cost, as well as cost per unit; demand estimates and revenues.
A financing plan with specific sources of finance and projected financial cost, shall be included in this chapter, as well as:

the <u>financial evaluation</u>: rate of return (internal, financial) calculations;
pay-back period;
break-even analysis;
sensitivity analysis; and the

overall <u>macro-economic evaluation</u>: economic rate of return, including e.g. environmental aspects, etc.; the extent and/or intensity of such evaluation will depend on the overall importance, significance and potential impact of the development of a respective sector or region.
The national economic evaluation should be only incorporated in the pre-feasibility study; the local administrators and investors or entrepreneurs will not have the expertise to conduct such an evaluation.

Key success factors

As a special operational feature, relevant key success factors shall be established in the form of a specified project related checklist for rationalization of evaluation as well as for comparative purposes;

these factors of course will vary by type of project, by market and/or demand patterns, according to regional conditions, etc.

Indicative for such factors , e.g., would be

- degree of diversification
- expertise of persons engaged
- conditions of payment
- market share
- promotion and marketing
- distribution
- reliability of delivery
- design of products
- quality aspects
- technical services
- pricing policy

The result of this exercise will be a profile of the key success factors highlighting principle features for possible success or failure. At the same time it highlights the sensitive areas, to which special attention has to be payed in laying out the design of a specified project (feasibility study).

(Case study).

## 2. Feasibility studies

### 2.1 Promotional activities and investment phase

Any promotional activities are to be initiated well ahead: potential investors, institutional as well as administrative support should be activated as soon as possible in the course of project preparation with a view to effective implementation later on.
The Manual proper shall include references to various promotional programs and stategies appropiate for the support of investment projects in the small and medium business sector.

### 2.2 Feasibility studies: objectives

Individual feasibility studies can be a costly exercise, especially for projects with an envisaged investment volume of US$ 50.000 to 500.000.

The cost for opportunity and pre-feasibility studies per unit can be reduced if such studies are conducted for a number of similar projects.
Depending on the number of projects only a fraction of the cost can be attributed to an individual project. Macroeconomic benefits of the investment could be used as a rationale for a system where the cost for opportunity and pre-feasibility studies are covered by public funds, thereby freeing the individual project of this financial burden.

For the same reason the cost of the feasibility study should be kept as low as possible; as mentioned before this restriction means tnat the feasibility study should be conducted at the local level with locally available personnel which in most cases will lack the necessary expertise or means for complicated investigations.

A feasibility study will only be conducted in cooperation and on behalf of a concrete interest of an entrepreneur and investor. The cost for the feasibility study are part of total investment for the project.
As mentioned before, ideally, the preparation of the feasibility study is to be conducted by the local branch of a development agency or financing institution. The obligations of this agency or institution would include the evaluation of the project as well as the control of the implementation (on behalf of investors). Furthermore, one of its most important tasks is the continuous support of the entrepreneur, whereby the local branch of the intermediary agency in turn will be supported (and controlled) by the central unit.

A material part of that support are the data collected for the pre-feasibility study. The collected data can be understood as a pool of information or data bank from which the basic data for the feasibility study can be obtained. However, the feasibility study will have to include data on the local conditions of the individual project.

However, a feasibility study shall be more than only a way of credit approval. Its main objective has to be the preparation and evaluation of a business opportunity and it has to provide the entrepreneur with basic information to formulate his business strategy and to project future cost and receipts; secondly it has to provide creditors with an evaluation of the project.

## 2.3 Contents of a feasibility study

### 2.3.1 Executive summary

As in the pre-feasibility study the summary should provide the reader of the study with a short version of the report, which contains the comprised results of the study, as well as a conclusive evaluation of the project.

It should describe the project history, refer to corresponding opportunity and pre-feasibility studies and name the promoters of the program as well as the promoter(s) of the local project. This includes the institutions which will administer the project in cooperation with the local entrepreneur(s).

The summary shall also indicate how the project relates to the economic and industrial policies and the (local) economic structure.

Detailed results shall be displayed in the form of structured overviews, while a description of methods and discussion of results will be restricted to the corresponding chapters.

Overviews:

- Market and plant capacities
- Material input
- Location and site
- Engineering, technical aspects
- Manpower and expertise
- Project implementation/financing
- Institutional support
- Financial/economic evaluation

Financial cost/benefit estimates in such overviews are to be related to periods of construction and operation.
(Implementation, start up phase, full capacity utilization).

Macro-economic variables

Most macro-economic variables will be derived from the data file of the pre-feasibility study.

Macro-economic variables are, e.g., number of firms with similar and/or related production programme in the region or local area - the geographic limits will be determined by the envisaged market - , agglomerative or competitive effects the existing economic structure will exert on the new project (firm), and the existing institutions represented on the local level.

Macro-economic variables also include legal requirements and restrictions for the implementation of the planned project and its operation, as for instance environmental protection laws and bookkeeping requirements.

(Case study).

### 2.3.2 Project description

This chapter is to contain a detailed description of the basic features of the intended project, that is:

- location: town, village, county
- target groups: private consumers, other industries, public demand; local, regional, national and international markets
- production programme: products, services
- technology: machinery, licenses, innovation and origin of technology
- intended investment: building, machinery, etc.
- estimate of total investment in value of local currency (or US $)

These characteristics should relate to the results of the pre-feasibility study as follows:

| Pre-feasibility study | Feasibility study |
|---|---|
| type of industry, products | production program |
| technology | intended investment (machinery,etc.) |
| target groups | specific markets, demand patterns |
| range of investment | estimate of total investment |

The items of the feasibility study are in general more specific and better defined (e.g. +/- 15 %) than the corresponding items of the pre-feasibility study; the latter may include, e.g., a range of (related) products or technical processes, and thus be more comprehensive while the feasibility study has to be specific and has to choose from the range of alternatives as presented in the pre-feasibility study. Therefore, feasibility studies are not to contain, e.g., products not included in the pre-feasibility study nor shall estimates of total investment surpass or fall short of the defined range of investment cost (+/- 30 % as a rule).

Furthermore, pre-feasibility studies should provide data files, indicators and methods of data evaluation; out of this data pool locally relevant indicators are chose for the feasibility study which, combined with locally collected data will be used to prepare the feasibility study (e.g. to estimate market demand for an individual project.)

(Case study)

### 2.3.3 Market and plant capacity

Plant capacities are determined by the size of investment, production programme, technology and market size.

In a given geographical area and a largly predetermined investment size the estimate of present and future demand will be based on indicators as suggested in the pre-feasibility study.

Depending on the target group such estimates could be based on average income, average spending or estimated spending on (similar) products, number of inhabitants, forecast of population growth, forecast of income development, number of competitors (local, national, imports), average size of competitors and market share.

The estimate of the market demand is not only a determining factor for the plant size but also for the marketing strategy:

- product pricing
- conditions of payment
- promotion
- distribution and sales organization
- service organization

and the production program:

- product design
- quality specifications
- quantities produced annually (capacity utilization)
- storage requirements
- diversification - different models, etc.
- flexibility

The determination of the plant size determines itself again a variety of decisions:

- serial production (size of series, economies of scale?) and/or custom-made products
- time schedule of production
- emissions - wastes and effluents
- time schedule

While the pre-feasibility study offers a variety of possible alternatives, for instance for disposal of wastes and sewage, in the feasibility study one of these alternatives has to be selected and their cost calculated. It also has to be noted that most specific decisions as treated in the subchapters are interrelated with decisions in other subchapters, in the case of plant size for instance with the technology used, the material inputs and their quality, etc.

(Case study)

### 2.3.4 Material input

Material inputs are raw materials, processed industrial materials (intermediates), manufactures (sub-assemblies), auxiliary materials and utilities. This chapter refers also to the availability of subcontractors and/or producers which could supply services or goods and could be used as an alternative to producing the corresponding products or providing the corresponding services. The decision if such services or products shall be bought rather than produced will be based on cost comparison of the alternatives, the reliability and quality of the subcontractor, the chosen capacity, etc.

The chosen materials should be described in this chapter:

- availability and supply (sources), delivery
- reliability of sources
- quantities needed
- qualitative requirements and properties
- total cost - inclusive transport, storage, conditions of payment
- estimate of future price development
- cost per unit

This chapter of the feasibility study should lead to a supply program and a detailed estimate of variable production cost and an estimate of other material input related cost.

For smaller and medium sized projects these questions will be of smaller importance than for large industrial projects. However, if the project refers to manufacturing it will still remain an important aspect. On the other hand, small enterprises in general have to face specific problems as buyers, which relate to their comparatively weak market position as compared to large industrial units. The Manual shall address these problems and suggest possible strategies.

(Case study)

### 2.3.5 Location and site

While the pre-feasibility study will furnish checklists of the necessary characteristics of a suitable location, the preparation of the feasibility study will start with a description of the characteristics of a chosen location and how well they cope with the requirements.

Description of the location:

- geographical location in relation to populated area, in relation to suppliers and potential customers
- technical infrastructure - electricity, water, etc.
- traffic connections - roads, train, airplane, ship
- communication - telex, telefon, etc.
- legal requirements - permits, etc.
- taxes, subsidies - state, local, etc.

Construction (civil engineering)

- site preparation
- building requirements as determined by machinery, production process and plant organization
- availability of contractors
- availability of building materials
- quality of contractors and materials

Alternatives could always include the use of an existing building which in most cases has to be adapted to the needs of the project.

Since for instance flow of materials are largely dependant of the location and site of the enterprise, plant organization shall be included in this chapter of the Manual.

Plant organization

- flow of materials: location of machinery and storage facilities within the plant
- location and equipment
- production units
- administration and sales

This chapter should further include all relevant cost estimates as for instance:

<u>cost of acquisition and erection</u>:

- cost of land
- legal expenses
- planning
- site preparation
- infrastructure
- building cost

<u>cost of maintenance</u>:

(- rent)
- energy
- other maintenance cost and repair

Since the phase of erection is a very specific and crucial step in the implementation of a project, references to a time schedule for the phase of erection shall be made in this chapter already (see also chapter 2.3.8 project implementation).

(Case study)

### 2.3.6 Engineering and technical aspects

The technical aspects include the machinery and the technical production process.

If the pre-feasibility study offers various alternatives, one alternative has to be selected on the basis of the

- production program,
- required flexibility,
- standard of quality and quantities to be produced,
- cost of technology (including license fees, etc.),
- local technical infrastructure (power, water, etc.), and
- correspondent building requirements.

Availability and cost of services and spare parts on the one hand and the demands of the technology on the expertise of operators and origin of technology (domestic or foreign) on the other, are also important variables for the decision.

This chapter should deal primarily with cost estimates for the acquisition of the machinery/technology and the related production cost (maintenance, service, power consumption, etc.).

The cost for the building requirements - site preparation, building and other civil works - have been treated in chapter 2.3.5.

(Case study)

### 2.3.7 Manpower and expertise

This chapter will start out with the personal requirements on the entrepreneur. Since the entrepreneur and his entrepreneurial, managerial and technical skills are of the utmost importance for the success of small and medium sized enterprises special attention has to be paid to his personality.

The description of other manpower requirements of small enterprises can begin with a simple organizational diagramm, which will give an overview of the number of needed personnel and indicate the level of necessary expertise.
Thus, the Manual shall suggest procedures for the estimation of the main personal-related parameters, which are:

- number of persons engaged by level of expertise
- cost of labour by level of expertise
- related cost: taxes, social security, fringe benefits
- cost of necessary facilities(see also building cost)

Availability of labour and expertise: local labour market

In most cases small and medium sized firms will be restricted to the regional labour market. It follows that training and schooling facilities will be needed to acquire the necessary expertise, which could necessitate the following cost:

- cost of training/schooling
  (including cost of trainer if necessary)
- cost of training period

Schooling and training of specific skills might be also taken care of by a public institution, if this appears economically (and socially) desireable.

Depending on the required skills i.e. the production process schooling-training combinations as for instance in the dual system of apprenticeships could be valuable models for the education of a skilled labour-force. This question surpasses the limit of the specific project and should be treated in the pre-feasibility study. In the feasibility study possibilities could be checked to introduce such system on the local level.

(Case study)

### 2.3.8 Project implementation and financing

Using the scheme as laid out in the pre-feasibility study, this chapter of the feasibility study should list all necessary steps of the implementation phase and provide a plan for action and control; it should assist in the preparation of a time table for the implementation phase including tabulation of the capital needed at the various steps and how it will be financed. All figures should be time related.

Furthermore, the Manual shall propose a model for a financing plan for small enterprises (small projects).

(Case study)

### 2.3.9 Institutional infrastructure

The pre-feasibility study should describe the availability of and the need for institutional support. (Under certain circumstances these findings could stimulate the establishment of additional institutions.)

The feasibility study would refer to above results and check if such institutions are locally represented. This chapter would also include a description of which services, how frequently and at what point of the implementation phase are needed. This refers primarily to

- <u>public institutions</u>
  regional or local authorities, branch offices of development organizations, educational administrations and institutions, labour-exchanges, etc.
- <u>private/business institutions</u>
  regional and local offices of professional associations, chambers, unions, affiliated training centers, etc.
- <u>cooperative institutions</u>
  for economic and technical research, quality control (laboratories); credit-, sales-, storage-, etc. cooperatives
- <u>business services</u>
  certified public accountants, EDP-services, wholesale companies, transport, storage firms, sub-contractors, banks, insurance companies, etc.

Most important is the location of the institution which will administrate the project on the local level and support the entrepreneur/investor in the implementation phase.

This chapter of the Manual should also include the cost for such services, which will increase if they are not locally available.

As primarily indicated by the pre-feasibility study a number of similar projects in a region could lead to the establishment of a regional branch of a needed institution.

## 2.3.10 Financial and economic evaluation

Financial evaluation:

All former cost-estimates will be summarized in this chapter and will lead to the following tables:

- projected annual investment expenditure
- projected annual production cost;
  total cost per unit, variable cost per unit
- projected annual sales
- projected annual gain/loss

- financial plan

Source of finances, conditions (rate of interest, monthly installments, etc.)

This information has to be used in the calculation of indicators such as:

- Internal rate of return
- Cash-flow table
- Pay-back period
- Output/person engaged
- Value added/person engaged
- Labour cost, cost for material inputs as related to total cost

  etc.

After the definition of fixed and variable cost and above indicators break-even analysis and sensitivity analysis could be performed and, consequently, results can be evaluated and compared to the results of the pre-feasibility study.

Economic analysis:

As mentioned before the economic evaluation should be restricted to the pre-feasibility study. In the feasibility study it should be only checked if the project fits the parameters laid out in the pre-feasibility study.

Key success factors:

Using the checklist as laid out in the pre-feasibility study a project profile shall be drawn up, using the information of the preceding chapters. This profile should show where the specific project has its strong points and its problem areas which might demand special attention.

Averages of indicators could be used to evaluate the results provided that such averages are available in the data bank.

(Case study)

ANNEXES to the Manual

Annexes could include a catalogue of ratios with formulas as used in the Manual;

descriptions of structure and organisation of data banks for the small business sector.