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ESTABLISHMENT OF A LEATHER AND SKIN-PROCESSING
INDUSTRY IN DEVELOPING COUNTRIES*

presented during the Inter-Regional Seminar on the
Generalized Preferential System (GPS) for Less
Developed Countries and for Developing Countries
with medium income

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I. Introduction

Less developed countries with small incomes are only rarely possessors of large quantities of raw materials. In the past the only exception was for leathers and raw hides, for which these countries had been the traditional suppliers. Today it is obviously the main aim to transform as much raw material locally, so as to earn a maximum of added value.

It has been shown, nevertheless, by recent studies and in particular one undertaken by Bo Lundén, a UNIDO expert, that the establishment of processing industries for leather in the countries referred to had not produced the expected results. Realization of practically all projects had been hamstrung by the same obstacles everywhere, that could be concretized in one term: feasibility.

UNIDO has published a Manual on the Preparation of Industrial Feasibility Studies that is perfectly applicable to leather. Although this booklet does not offer any solution applicable to the problem incumbent on the establishment of tanneries throughout the world, development to realization has been greatly simplified by the introduction of a systemized method for the investigation of all the elements, which oppose the harmonious starting up of an industry that is in a continuous state of evolution. It is exactly this sequence of the work that has been chosen for the present study.

II. Relative advantages offered by countries with modest resources and those less developed

The advantages favouring the development or establishment of a leather industry in those countries concern conditions relevant to:

- Availability of sufficient quantities and quality of raw hide;
- Availability of sufficient manual labourers for a type of work not requiring a great deal of qualification;
- Availability of water in sufficient quantity and quality, as well as an opportunity to run off waste waters without any damage to the environment;
- Opportunity for the harmonious placement of the final product, either on local markets or in the international market.

The general tendency today is to shift tanning industries from the developed countries to the developing countries. This calls for the following remarks:

- The leather processing industry is strongly bound up with fashion developments. To develop fashions there is need for highly complicated technologies. A transfer of such technologies to the developing countries referred to, poses not only the question of financing, but also of professionals with the required education and expertise.
- Industrialized countries are always inclined to satisfy a certain percentage of the demand of their own market themselves for obvious reasons of commercial dynamics. In most cases this is that sector of the market which offers the best profit, making inroads by the above-mentioned less developed countries extremely difficult.
- The possible use of local tanning materials, the supply of chemical products and, possibly, of raw hides lacking in quality and/or in quantity, always poses the problem of dependence on the world supply markets, that are - in certain cases - particularly with regard to raw hides, extremely fluctuating and speculative.

It may nevertheless be said that leather and leather processing industries offer evident advantages, if their construction and development is kept under perfect control.

III. Studies concerning tanneries

As already indicated above, this study has been drawn up in accordance with the layout of the UNIDO Manual for the Preparation of Industrial Feasibility Studies. Detailed information may be found in that document, while the case of a practical hypothesis will be elaborated alongside with this study. Such a case can only be a hypothesis, because every tannery has its own history and development. Every manufacturer has its own technology and in consequence the plans for manufacturing lines are different and specific. It is just this flexibility required for the machine equipment with regard to the continually changing technologies that makes the tannery industry so vulnerable. The greatest danger lies in those ready-for-starting industrial units that do not consider the WHOLE problem.

It is therefore useless to try to establish a "once and for all" study, applicable to all cases; every tannery requires its own study and parameters have to be redefined in each case.

Due to the above the figures used in the course of the present study must be regarded as purely illustrative and not representative for any given case.

CHAPTER I

Project synthesis

The first chapter begins with the general synthesis. For the present case and as an example, mention is made of a concrete project in a developing country. Names are omitted voluntarily.

1.1 Project promoter (chapter 2)

The project promoter is the only responsible authority. His identity is clearly and completely described. It may be a private person or a governmental institution or non-governmental, specialized or not specialized.

1.2 General project indicators

The general orientation of the project is directed towards the optimal and complete transformation of the raw material "raw hide" obtainable in the country.

Market orientation, which is the basis of this study, is centred on a 70 per cent local consumption of the finished ovine, caprine, bovine product and 30 per cent for export in the bovine and caprine category.

The economic and industrial policy guiding the project referred to, must, according to the national development plan, be a policy of full employment and of an industrial decentralization towards less secure zones. Besides, the project aims at the law for industrial promotion offering certain fiscal advantages. Lastly, the project enjoys substantial financial support (free construction site and infrastructure) by the regional authorities.

The history and the context of the project are part of the progressive migration of the leather industries from the developed countries to developing countries. Conscious of this opportunity the Government included this development in its expansion plans. Tanneries being an industrial branch, the development of which is difficult, there will be need for the co-operation of a foreign group to operate a joint venture. From this operation follows a technology transfer allowing the whole leather industry to take off. Product export is - at the same time - intended to safeguard a high level of quality, but also to gain a position in the traditional international marketplace and to earn back that hard currency expended in the purchase of materials, equipment and chemical products.

1.3 The market

Seventy per cent of the tannery production is destined for the local market and 30 per cent for international markets to be placed there by the partner company. The 30 per cent refer to 270,000 goatskins per annum and 1,000,000 oxhides per annum. The 70 per cent of the production are to supply the shoe and fancy leather goods industries and the shoe company previewed in the tannery-zoning plans.

The leather demand of the local market for 1981 (a year of full tannery production) is previewed as follows:

Oxhides	13,964,000 pieces
Sheepskins	8,281,000 pieces
Goatskins	3,491,000 pieces

excluding the previewed shoe factory.

Full leather production from local tanneries at the 1981 level will be:

Oxhides	7,000,000 pieces
Sheepskins	4,620,000 pieces
Goatskins	2,970,000 pieces

For the tannery in question, full production levels will be:

Oxhides	4,375,000 pieces (1 million pieces for export)
Sheepskins	1,700,000 pieces
Goatskins	1,125,000 pieces (270,000 pieces for export)

The initially installed capacity of the enterprise may be extended by 25 per cent by merely increasing the personnel.

Product sales are planned as follows:

- To the shoe factory, which will require 1,500,000 pieces oxhide and approximately 750,000 pieces sheepskins;
- For export, through the partner-network approximately 1 million oxhides and 270,000 goatskins.
- The rest, i.e.
 - 1,875,000 oxhides
 - 950,000 sheepskins
 - 855,000 goatskins

is to be sold on the local markets, covering a part of the gap between demand and local production.

1.4 Raw materials and others

The materials required for a tannery procedure are raw hides, chemical products, water and energy.

Ovine and caprine raw hides can be obtained locally, it being a fact that there is a surplus already being exported (see table, chapter 4).

All oxhides are to be bought locally. The origin of the raw materials is a guarantee for sufficient continuous supply.

All the chemical products required will have to be imported.

All auxiliary materials (steam, gas, water, electricity) will be available locally.

1.5 Construction site

The choice of construction site must be guided by two basic factors: the availability of sufficient water of required quality and the possibility of waste water removal without any damage either to agriculture or irrigation. The site that will best respond to these requirements will be the one where there is also an abundant labour force and where the Government intends to build a shoe factory.

The real estate where the tannery is to be constructed (2.4 ha) belongs to the Government. It will be ceded for a symbolic sum of 5,000 dollars. Two thousand dollars will be spent on tree-removal. The water required locally is also to be supplied in sufficient quantity at a symbolic price.

It being a fact that the region is one of cattle-rearing and agriculture, it has been decided by the authorities to construct a water recycling plant. This plant will have to be financed through the project and will cost approximately 450,000 dollars.

1.6 Project engineering

The project is laid out for the continuous fabrication of 10.6 tonnes/day, subdivided into 8 to oxhides, 0.9 to goatskins and 1.7 to sheepskins. A rectilinear layout has been chosen, to be constructed on a single level in mixed construction (armed concrete).

Leather manufacture will be on three distinctive lines: bovine, ovine, caprine.

The technology to be used will be that of the foreign partner, the tannery will be operated with a technology proven on the world markets.

The chosen equipment is the latest and intended for three shift use.

The investment costs will be constituted as follows:

	<u>Foreign</u>	<u>Local</u>	<u>Total in thousand FB</u>
<u>Equipment:</u>			
Production	\$ 3 000 000		
Auxiliaries	700 000		
Services	60 000	\$ 150 000	
Diverse	225 000		
Social		8 000	
			4 143 000
Transport expenses			500 000
Replacements			220 000
Assembly			350 000
Unforeseen			40 000
			<hr/> 5 253 000
<u>Civil engineering:</u>			<hr/> 2 700 000
			<hr/> <hr/>
			<u>In US dollars: \$7,953,000</u>

1.7 General expenses and administration

Enterprise organization begins with the development of the project. It is based on two departments, the technical and the commercial-administrative, each headed by a director and supervised by the Directorate General (chairman/general director). The technical directorate supervises the manufacture, the auxiliary services and the laboratory. The commercial and administrative directorate supervises purchases, sales and administration.

The director-general is responsible to an administrative council normally designated by the company's annual meeting.

The composition of general expenses is subdivided in such a way that 50 per cent of the expenses cover the normal accounts, excluding management expenses and representation. The other 50 per cent cover management expenditure, representation, trips and missions, councils and assemblies.

General expenses amount to 30,975 dollars per month or 371,707 dollars per year and include a necessary and sufficient reserve to cover unforeseen expenses (85,500 dollars).

1.8 Personnel

The tannery will employ 257 persons, 225 workers and 32 employees. Of the employees 20 are directly linked with manufacture. Eighteen of these are qualified technicians.

The workers will be selected from the region and trained locally by the superior tannery technicians and the machine suppliers.

The foremen have already been selected and will receive technical training in tannery schools in Europe. They will receive practical training in the tannery of the foreign partner.

The other technical staff (technical direction, service engineer) will receive their practical training from the foreign partner.

Personnel recruitment will be spread over the first 23 months of the project's duration.

The cost of the personnel to be recruited before the starting up will amount to 128,707 dollars. During the starting-up period the expense will amount to 150,126 dollars. During that period (21 months) an additional sum of 34,280 dollars is previewed as hiring and training reserve.

The social expenditure is rated at 45 per cent. With full production, total personnel expenditure will amount to 621,365 dollars per annum.

1.9 Project development

Project realization is subdivided into three phases:

- A phase of installation assembly during 15 months;
- A phase of starting-up and running-in during 6 months;
- The final phase of normal production from the twenty-first month onward after the beginning of factory construction.

During the fifteenth month production reaches 50 per cent of normal capacity. During the whole of the starting up of the project the management of the enterprise is assisted by the foreign partner within the framework of an engineering and know-how transfer contract. A contract of technical assistance with the same company covers the start of production until 100 per cent.

The phases of project realization are seen to be realistic.

1.10 Financial analysis of the project

The global investment sum is composed as follows:

	<u>In US dollars</u>
Terrain and site	5 000
Civil engineering	2 700 000
Equipment	5 253 000
Technology	315 270
Expense of first establishment	631 000
Initial run funds	1 053 000
	<hr/>
Total	9 957 800

Of this sum 6,619,500 dollars will be needed during the first year and 3,338,300 dollars during the second.

During a normal year of operation the current production expenses will amount to 7,099,230 dollars, while earnings will amount to approximately 9,523,750 dollars. The difference of 2,424,520 dollars will serve to cover the fiscal charges and only during the first 5 years, the technological expenses. The rest is to cover the financial expenses and earnings.

Taking account of the payment flow during the first 17 years (2 years of construction and 15 years of life of the main equipment), apparent value will increase to 4,439,250 dollars at an interest rate of 10 per cent per annum.

The internal rentability rate increases to 18 per cent.

CHAPTER II

Historic and basic data

To assure the tannery's final success it will be necessary to show its importance and the position it will occupy in the national leather sector, as well as the country's industrial concept. A detailed description of the historic development of the idea to develop the enterprise will supply the necessary explanations, but should include a complete enumeration of investigation and pre-investment expenses. These are very often passed over in silence, leading to severe "hidden" expenses arising during realization.

2.1 Project background

Precise establishment of the following basic data:

- Local availability of raw hides with complete statistics of cattle-rearing and slaughtering, as well as the collecting-recovery rate;
- Long-term water resources (20 years minimum).
- Availability of labour;
- Availability of terrain;
- Global indication and localization of markets.

In all statistical elements or projections it is important to obtain total assurance of source reliability. This reliability must be undoubted.

2.2 Project promoters

A simple listing of promoters is not enough. A systematic study of the financial, economic or social situation of the promoters or partners serves to show the real situation of the future enterprise. It will also demonstrate project limitations due to the promoter's diverse possibilities or limitations. It is always recommended to associate with the following as partners:

- Raw material suppliers: cattle-farmers, slaughter-houses, collectors;
- Financial sources. banking establishments, development banks, agricultural credit banks, industrial credit banks, etc.;
- Where possible technological sources: joint-venture partners supplying know-how and access to interesting markets;
- Where possible partners with a position in the market: processing industries, foreign distributors.

2.3 Project history

Very often a goodly number of studies has been done on a country or region. A study of these previous investigations may avoid serious errors. Here it is also important to include sectoral studies and national plans so as to establish a concordance of project reviews with the national strategy (e.g. job creation, investment per created job, etc.).

2.4 Studies

This part is not only important in the list of studies to be undertaken, but also with regard to the expense caused by them. For engineering and initial know-how transfer foreign intervention will often be necessary and will probably cause very important currency expenditure. A correct and rigorous assessment of the technologies needed may achieve important savings. The cost of these studies is a part of pre-investment expenditure and may be evaluated as amounting to between 1.0 and 3.0 per cent of investment costs.

CHAPTER III

Installed capacity and the market

3.1 Study of demand and capacity in the market envisaged

The product determines the technology and also the equipment to be used. This is of prime importance in making a choice of manufacturing equipment and in the whole project conception. Very often it is - however - paid little attention to because the manufacturing programme is only defined in the vaguest of terms and very generally, e.g., fabrication of small hides, manufacture of oxhides, etc. It is also true that even more often the market aimed at is not yet very developed or little is known about its absorption capacity for a more closely defined product.

Here we should consider two cases frequently met with.

3.1.1 The national market

It is insufficient to define types of manufacture in the very vague manner alluded to above, therefore, taking account of the raw material available, a subdivision ought to be undertaken according to the uses envisaged; for instance: leather uppers, sole leathers, morroco leathers, etc. Such a listing must obviously take account of national needs, so as to avoid materials that cannot be used in the country at all. But immediately and according to classification proper processing types have to be defined: flexible leather, lining leather, sandal leather, leather for working articles (working aprons, window cleaning leathers), leather for morroco goods, leather for handicrafts articles, etc. A market study must always be undertaken in depth and systematically, so as to know the real requirements, taking account also of socio-economic factors of great variety. It is very often useless to plan the costly production of pure aniline leathers, because there will be no local customers for such an expensive product. Looked at from another angle, the manufacture of such leathers would require a type of raw material and a relevant technology, that will probably not be available locally. The search for a marketing strategy is therefore of the greatest importance and unfortunately there cannot be a universal model for such a search; every market has its own defined identity. A certain number of principles must nevertheless be regarded as essential.

- Market studies

- Perfect knowledge of verified statistics;
- Selection of an applicable research method;
- Determination and exact localisation of the planned product;
- Exact knowledge of present and future demands;
- Possibilities for launching a product in the market.

- Sales planning

- Description of sales programmes with alternatives;
- Justified selection of determined programme;
- Justified selection of a marketing strategy.

- Sales revenue

- Based on the above data sales income should be assessed.

- Commercial expenses

- Calculate sales and distribution expenses.

3.1.2 The international market

Aiming at the international market one must possess mastery of all the mechanisms of international marketing. Such mastery may be acquired in two different ways:

- Acting for one's own account;
- Using the sales network and the commercial installations of a well-established partner.

Whatever the method chosen, there will always be a need to apply technological know-how to local conditions, i.e.:

- Perfect knowledge of fashion and demand in the market aimed at;
- Material flexibility of production means;
- Continuous updating on new manufacturing processes,
- A judicious choice of raw materials;
- Rapid reaction to demand;
- Fast transport, available and subsidized;
- Proven quality mechanism.

If on the one hand acting for the enterprise account offers greater immediate freedom and avoids the always delicate problem of remuneration (royalties and otherwise) and being able to draw on the better part of production at any time, there is - on the other hand - with the choice of a partner, in whatever firm, a better guarantee of technological and commercial support, under the condition - of course - of a well-considered co-operation contract, requiring careful editing and continuous control during its execution. Mastery of a market is an exercise requiring not only years of intensive study, but also continuous prospecting and requiring the use of an imposing commercial apparatus, which is often very expensive. Such an effort may often be too much for a developing country, not only due to questions of training, but also for reasons of industrial logistics.

3.1.3 Market capacities

It is vital to know the exact capacities of the markets aimed at. As they become more and more accessible, competition will become always sharper. Under such conditions it will be very important always to possess alternative solutions. The choice of product for local markets will always have to take account of socio-economic factors, so as to avoid productions not suitable for local consumption.

3.2 Production programme

After determination of the needs of various markets and a study of the available raw materials it will be necessary to establish a production programme. This is to be used as the basis for an acquisition plan for manufacturing material. This will allow the establishment of the level of initial and intermediate stocks of material and products so as to allow a maximum of manufacturing flexibility. It will also allow the definition of the technical parameters of the enterprise and its permanent viability. In tannery production environmental impact is very important and the choice of technology and of the production programme will largely influence the resulting degree of pollution. If the above parameters are chosen carefully, this will allow an important reduction of the harm caused by pollutants and will reduce the expenditure and costs caused by purification stations. Investment costs of these stations will be discussed in chapter 5.

3.3 Production capacity

Most of the studies concerning tanneries in developing countries refer to a production of over-capacity. This installed surplus capacity is due to erroneous assessments of various kinds:

Imperfect knowledge of the national supply potential in raw hides:

Over-estimation of the demand for leather:

Ignorance of the required quality levels:

Over-abundance of production equipment supplied under a 'ready-to-start-up' system;

Lack of sufficiently trained management personnel.

Such a situation is very detrimental to the project's future, because it implies a blocking of sizable financial means due to meaningless investment and the availability of never used equipment.

The general rule to be adopted for an evaluation of the capacity to be installed:

Raw hides in sufficient quantities ought to be available locally:

Such a quantity of skins could be calculated as:

100,000 oxhides (or equivalent in smaller skins) for each industrial unit,

20,000 to 100,000 hides (or equivalent in smaller skins) for semi-industrial units using less developed tanning methods,

The quality of raw hides must be evaluated carefully, so as not to over-estimate the quantities really suitable for industrial processing.

CHAPTER IV

The need for tannery raw materials

4.1 General

A tannery processes the raw hides coming from the slaughter-houses into finished leathers likely to be of interest to a large group of manufacturers of leather goods: shoes, morroco-leather goods, etc.

To achieve such a product, the initial choice of raw skins (hides) is of overwhelming importance, because the quality of the finished goods can rarely be better than that of the skins. As with all industries, the processing of skins requires energy. Electricity powers the machines, steam is used for drying and for the production of hot water. Water consumption is important. Part of the water used is polluted and effluents have to be treated and purified.

4.2 Raw hide

The types of leather to be manufactured, or what is called the collection, obviously depend on the demands of the market. It is therefore necessary to find a golden mean between those demands and the real quality, in the required quantity, of the raw hides available. It is therefore very important, not only not to over-estimate availability, but also to define the characteristic properties, such as dimensions, thickness, skin structure and grain character.

These evaluation elements also depend on a number of other circumstances, such as race, climate and rearing conditions. It is indispensable to review all these factors so as to know the exact raw hide availability situation. Reliability of statistical data is often questionable in many countries, not only due to the difficulties of information collection, but chiefly because of the subjectivity of the collector's observations. In any case, projects for the creation of tanneries should in all cases be accompanied by programmes for the improvement of raw hide quality.

Importation of skins should be avoided as far as possible, for the following reasons:

- Excessive expenditure of hard currency;
- Highly speculative markets;
- Growing supply difficulties;
- Lack of knowledge of the real nature of the imported product;
- Transport delays that may influence the quality (conservation).

Imports may only be justified where there is a lack of stocks or where a certain quality is required for a specified type of finished goods.

4.3 Chemical products

Chemical products used in tannery can be subdivided into three groups:

- Heavy chemical products: for the real tanning process. These are principally lime in powder form, acids, alkalines and for the tanning, tannines (chrome salts, synthetic and vegetal tannines). Among them there are products which might be purchasable locally or for which local production plans might be envisaged (acids/alkalines):
- Dyestuffs and foodstuffs are used in dyeing. Except for some foodstuffs (animal fats), all have to be imported;
- Finishing products. These are highly specialized products, giving leather its final characteristics and the aspect desired. Generally these will have to be imported and they involve a high degree of technological development. The producers themselves usually offer assistance for the application of these technologies.

The supply of these products often requires long order periods and therefore sufficient stocks ought to be laid in. However, accumulated stocks also bind important capital and what is even worse, cut down flexibility in production. In any case, it will be necessary to lay in stocks of the above sufficient to last for two to four months of production.

4.4 Sources of energy

These are to be obtained locally. To assure continuous supply sufficient stocks have to be assembled, as well as an emergency electricity plant to supply energy when the mains network breaks down. Water is an extremely important problem and technologies have to be chosen using least amounts of water. Water consumption per kg of hide processed should be approximately 35 to 45 litres.

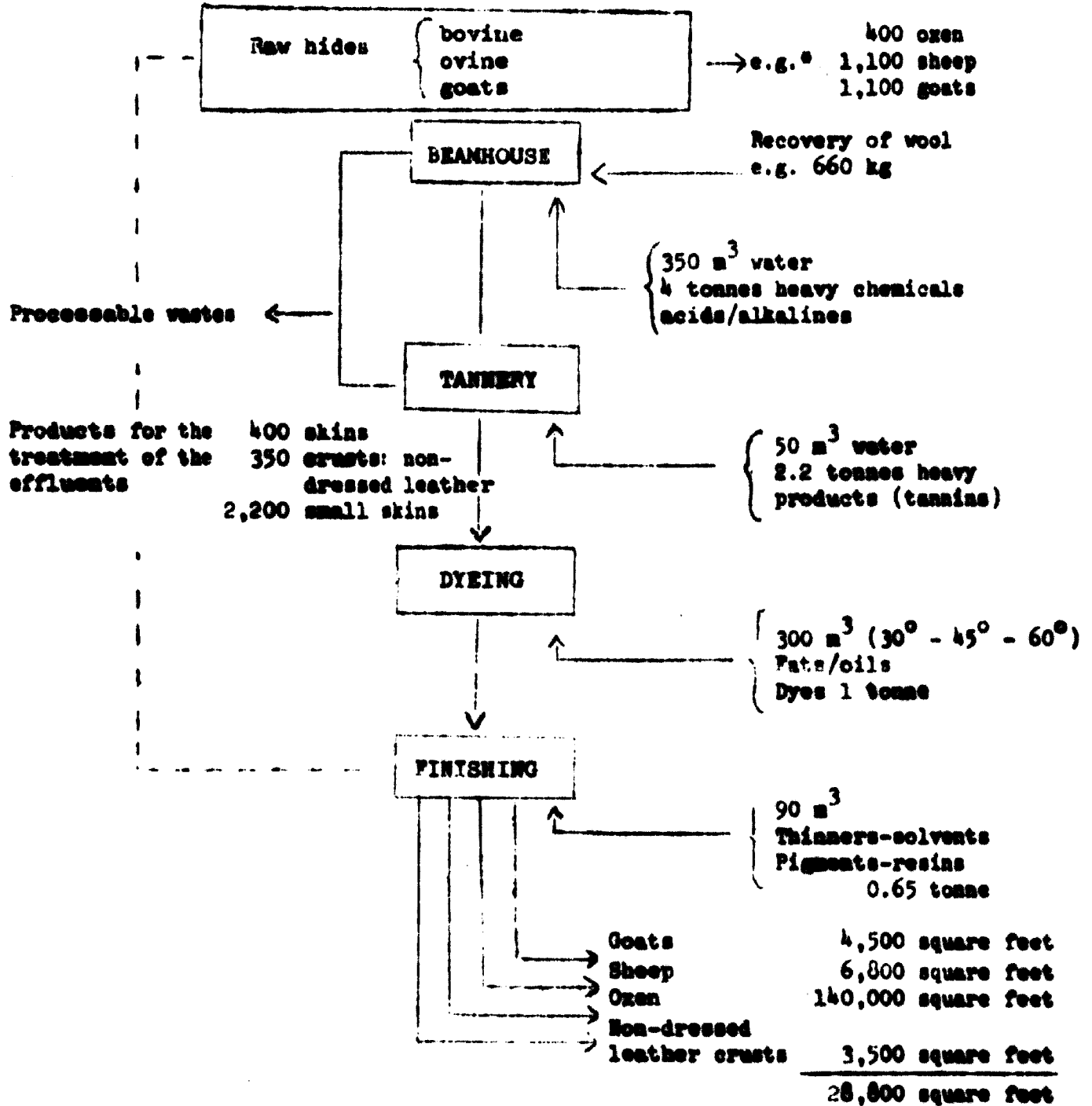
4.5 Supply programme

The supply programme must be rigorously based on the production plan. This is not only a matter of organization, but also of financing, because interruption of supply is as serious as the piling of excessive working stocks.

4.6 Waste materials and effluents

Solid wastes (scrap, dry and wet wastes, trimmings, cuttings, shavings) require special studies. They can easily be utilized in secondary industry (reconstituted leather, paper making, fertilizer). Effluents pose a more difficult problem, which will be treated separately.

Scheme of daily inputs and outputs



* The above is merely an example under the restrictions mentioned before.

CHAPTER V

Building site

The choice of a site for a tannery is influenced by a number of factors. In advance it is difficult to tell which of the factors will be the most important, because this will depend on the local conditions and the possibility of adapting these conditions to industrial needs. The availability of water in sufficient quantity and quality and the possibility of draining the residual water will be a demand valid for all the possibilities.

5.1 The site

Tannery is a light and polluting industry, wherefore it is necessary to choose a real industrial terrain. A tendency exists to remove tanneries to desert sites. This is not, however, any solution to the pollution problem, but a crushing load for the project. On the other side, a really industrial environment would solve most of the infrastructural problems. The cleaning of rejects of whatever kind is more of a national than a regional problem, which an individual enterprise cannot solve by itself.

5.2 Climatic conditions

Climatic conditions have a greater influence on men than on the product to be processed, if the technologies are seen to be largely adaptable. Their most immediate effect is on the types of construction envisaged and the more the climate is favourable, the more will it be possible to plan light structures or work in the open air.

5.3 Social data

Tanneries do not require specially qualified personnel and most of the workers will be simple stock handlers. Only the machine operators, the foremen and the management staff will be more specialized.

The social aspect linked with tannery site selection requires accessibility of the enterprise through classical transport means, as well as its integration in a normal socio-cultural system favouring a sound industrial climate.

5.4 Fiscal and legal data

Various countries interested in industrial development often take fiscal measures to activate the rhythm of investment. Such measures should be carefully evaluated so as not to over-estimate the advantages. Their impact must be calculated with precision and reflected in the financial calculations. The team undertaking the project feasibility studies must include a legal expert to calculate all the advantages to be gained in the financial, administrative and social domains.

5.5 Environmental impact

Environmental protection has become a preoccupation of the Governments of all countries. In the western world many tanneries have shut down because the problem of water residues proved insurmountable. Can we merely transfer these problems to the developing countries? Certainly not! But it is important to realize that the application of simple tanning techniques and the availability of space reduce the problem within reasonable limits. Even further: it is impossible to draw up a standard procedure applicable in all cases. The struggle against pollution begins on the workshop level, where one has to try to reduce water consumption, as well as to try to produce as few sulphur pollutants as possible. Recycling of the baths is a means to reduce the pollution rate of the effluents, but the technology is not always accessible and the size of the tanneries not always big enough. With regard to mechanical, chemical or biological treatments there is always the need for extensive local studies so as to avoid heavy investments without any yield for the final product.

CHAPTER VI

Project engineering

The extent of the project encompasses not only activities in the works, but also all the inputs, the outgoing products and all annexed activities. Such a global approach allows the assessment of a real and global sum of investments and to determine what these will support, when and how. Having defined the construction of the enterprise and the technology envisaged, it will be necessary to establish the type and number of equipment in agreement with the productive capacity required. The cost of the equipment and of its technology has to be defined. The cost of all the construction work and of the annexed activities needs to be estimated on the basis of concrete offers or assessments.

6.1 Extent of the project

Very often plans for the erection of a tannery are limited to a ready-for-operation enterprise. During the project execution a goodly number of activities and subsequent expenses will arise, which were not previewed and which condition the good operation of the enterprise. It is necessary to undertake a detailed study of the local situation to avoid such surprises.

From the point of view of the enterprise's production activities we have to consider everything which went before (or purchase services) and everything which follows (or sales service and after-sales service).

-- Auxiliary services before production

It is not possible to limit activities to a simple purchase of materials and products, but we have to be equally concerned with the economic determination of the stocks necessary. Local supplies often require a technical assistance, which -- even if it does not encumber the tannery, is a charge on its budgets. It will be better to assist the cattle merchants and the hide collectors so as to obtain raw hides of acceptable quality than to suffer production losses due to raw materials.

The danger of ready-to-operate objects, whose design is influenced by the industrial environment experienced by the designers and who do not take account of the local realities. Often the greatest economy to be obtained from such objects is to shut them down and throw the keys as far away as possible!

- Auxiliary services after production

A complete sales service must be organized to allow a systematic study of the local markets. For the international markets it will be more difficult to establish an adequate organization. Very often associations are formed with partners for this purpose, who possess appropriate sales services. It is necessary to obtain a transfer of practical know-how in this field and the cost calculated for this and related items. After-sales services are also necessary and the same applies with regard to assistance, as was noted with regard to the purchase services.

- Technology

The chosen technological procedure has to be described in every smallest detail. Such a description allows a justification of the choice and the amount of equipment and the calculation of the costs. Here again auxiliary services are numerous and vary from one country to another. It is not enough to indicate a technical or maintenance service.

The minimum parameters to be defined are:

The field of activity taking into account the industrial environment,
The possibilities of recruitment and training of specialized personnel,
Material and human reserves sufficient to assure proper functioning of the production machinery.

It is also basically necessary to describe how and when the technology is to be acquired. Tannery operation requires a certain experience and chief of all great technical flexibility. External know-how needs to be obtained in various forms and in particular:

Through assistance engineering,
Know-how transfer,
Technical assistance, licensing, etc.

The following is usually included in assistance engineering:

Planning: material requirements and necessary equipment,
capacity requirements,
choice of type of construction.

Rough drafts and layouts

Definition of production equipment

Follow-up and general supervision.

With regard to know-how transfer, the aim is to produce articles of good quality and always a quantity sufficient to guarantee the enterprise's rentability. In view of the different conditions found in different countries and also in each region of a country, the essential point of know-how is the adaptation of the technical and chemical processes to the conditions obtaining on site.

It is not sufficient - in this regard - only to rely on documentation in the form of basic chemical formulae and a range of operating descriptions with simple data concerning machine control, such as speed, pressure, temperature and other data.

The combination of atmospheric conditions, the quality of industrial water supplies and particularly the quality of the hides to be processed, will demand a modification of the chemical formulae and the execution of a series of measures to ensure high product quality.

Amongst other things technical assistance can consist of:

- Research and the creation of a collection,
- Realization of new formulae for these collections,
- Search for technical documentation,
- Supervisory work,
- Establishment of training programmes.

6.2 Equipment

Equipment needs to be chosen with regard to the technologies to be defined. For this reason, it will be impossible to predict which type of machine will be preferable to which other.

The following items will exert an influence on the choice:

Delivery periods,

After-sales service by the supplier,

Relative simplicity of operation and maintenance,

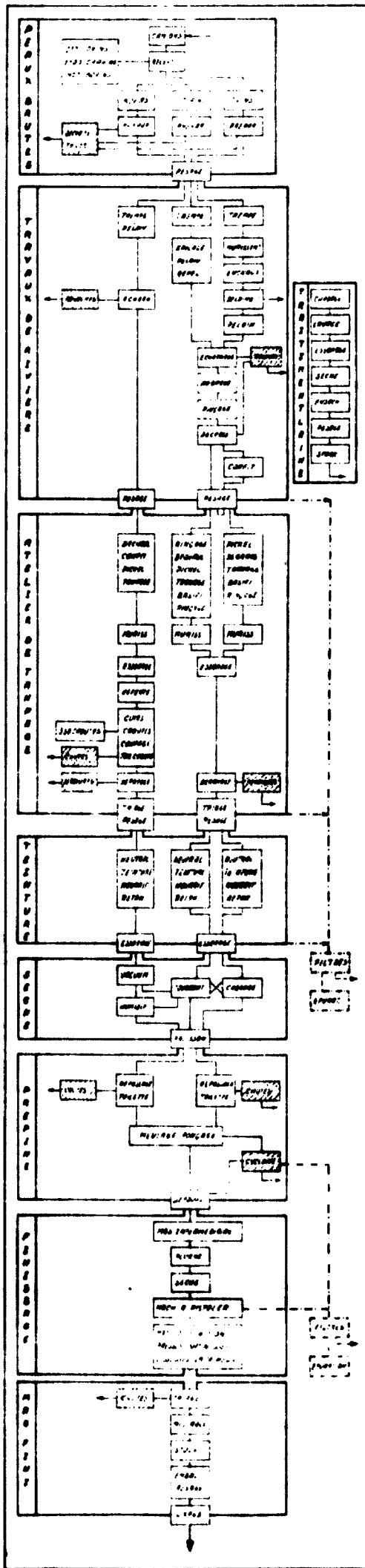
Guarantee or spares availability,

Modalities and costs of machine installation.

Very often the purchase price of a machine will double after installation because of local difficulties, etc. It is necessary to estimate these elements from a solid basis, so as to avoid unpleasant surprises.

6.3 Civil engineering

Construction has to take account of conditions on site and the equipment to be installed. It will often be difficult to obtain an industrial infrastructure, if the neighbourhood of an equipped industrial zone is not included in planning. If this cannot be obtained, it will be necessary to be extremely prudent in cost estimating.



CHAPTER VII

Organization

A tannery enterprise can be organized in various ways. Even where precise data of a tannery are available, there are always several ways of organization possible. It would therefore be wrong to adhere to any rigid scheme. Complex organization should be avoided, because it will make the development of orders and decisions long and irksome.

Description and definition of positions in the organization has to be exact, all the way from the director-general down to the last manual worker. This is a hard job, but it is the only way to avoid overlaps, functional incompatibility and badly made decisions.

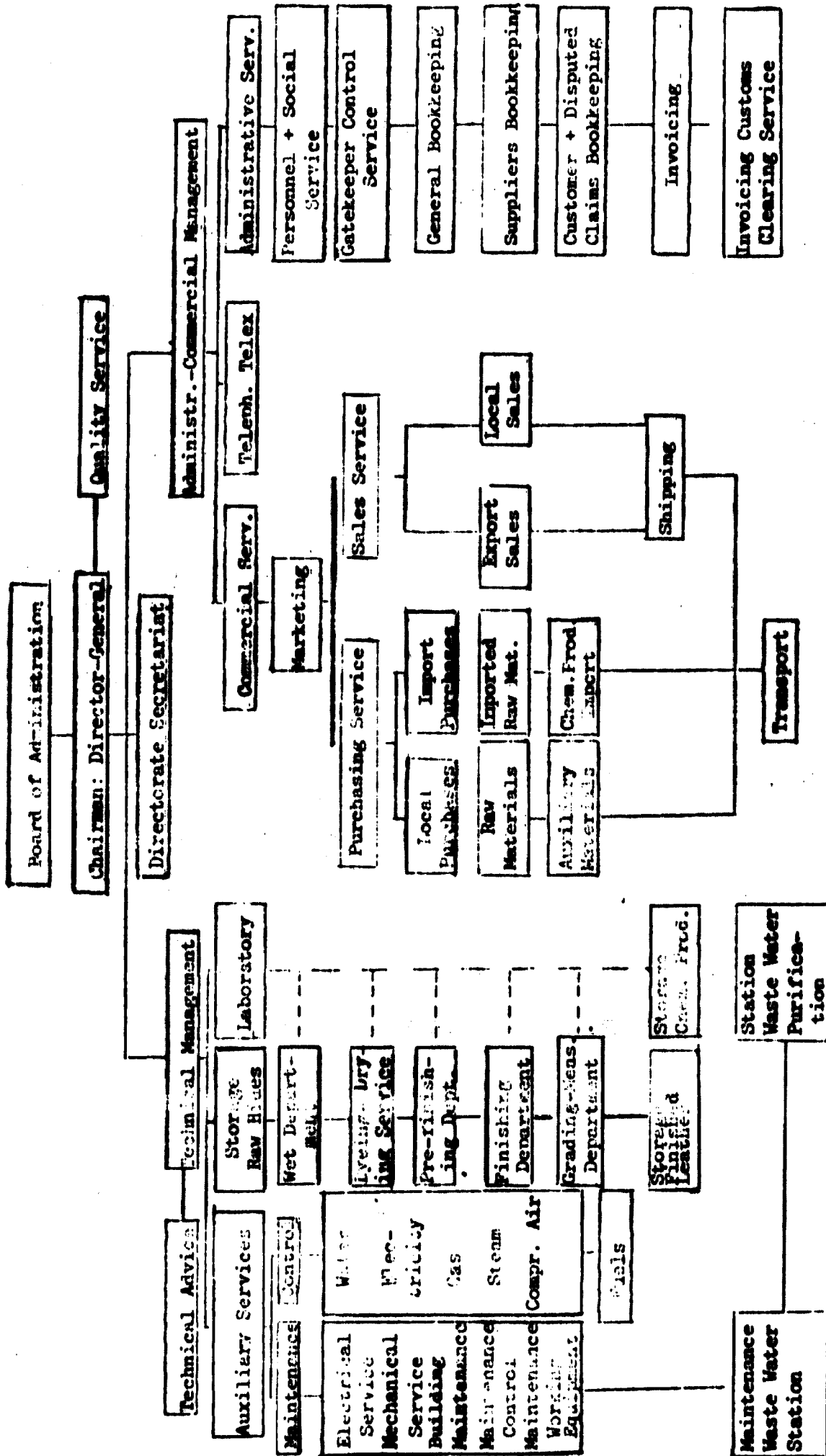
From the moment project execution begins, works organization must be supervised by the director-general and the technical manager. Organization structure will be extended and realised as the project advances.

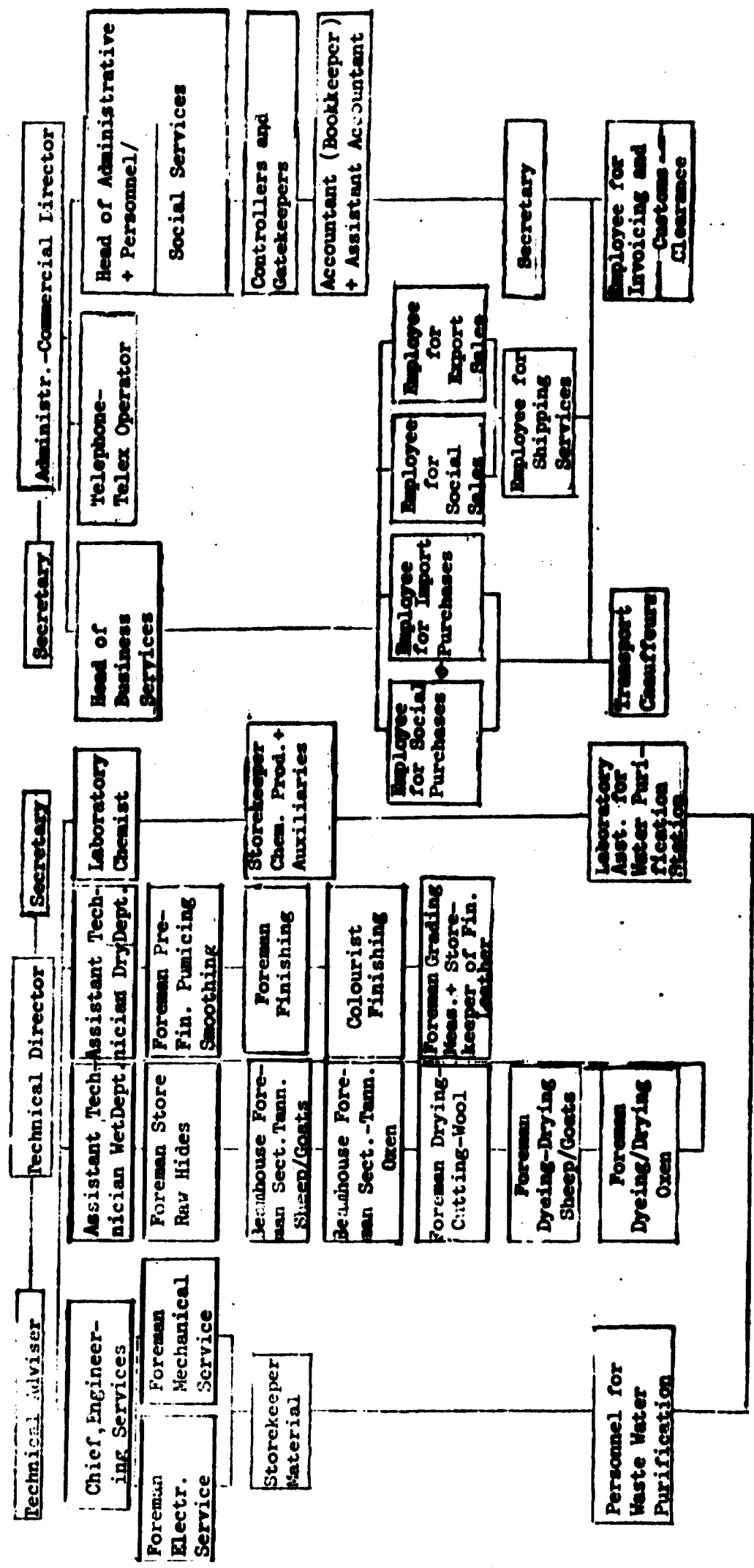
Organization may be based on two managing departments headed by one managing director each and supervised by a directorate-general.

Technical management is to supervise manufacture, the auxiliary services and the laboratory. The technical manager supervises a certain number of senior technicians in the dry and moist departments, a maintenance engineer and a laboratory chemist. This last expert is also responsible for the treatment of pollutant waste water in the purifying station. Manufacturing technicians are assisted by the foremen. The engineer is assisted by the foremen in mechanical and electrical requirements.

Administrative and commercial management supervises purchases, sales and administrative measures.

Organization





CHAPTER VIII

Personnel

1. Employment

Basic data concerning the number of personnel to be employed in a tannery is highly controversial and likely to lead to confusion. Tannage is not a very labour-intensive industry, likely to increase the sensitivity of output parameters. But it is recommended to establish the rate of output by worker and time unit, expressed in square feet of leather produced. Available figures should be handled with care, because they may be influenced by numerous factors such as: social environment, professional training, climate, etc.

Although the apparent yield of direct output may seem to render a good average, overheads are able to influence the over-all output of personnel in a very negative manner. This does not refer to any replacement of machines by people, but to cost overheads.

It is therefore important to draw up a list of required personnel as precisely as possible. It is not enough to indicate a number calculated for the quotients of theoretical output, but to define the exact number of future tannery employees with the aid of organigrammes and job descriptions.

2. Cost estimates

Derived from the above-mentioned data, it is possible to calculate the direct and indirect costs occasioned by personnel. In calculating the expenses the following items must not be forgotten:

- Paid holidays and annual leave,
- Non-productive days due to apprenticeship,
- Expenses under social security,
- Social security charges for non-productive days,
- Various output premiums.

The total of the above items is rarely less than 50 per cent if calculated with precision, although the national authorities usually claim the official charges to amount to between 20 and 30 per cent. This error source must be absolutely avoided.

3. Job inventory

Personnel should be adapted to each local situation arising, but it is nevertheless possible to define some general characteristics. These characteristics can often be a help in deciding candidatures, so that the necessary training and information can be given well before the start of the project.

Higher staff

The Chairman: Director General:

He maintains contact with governmental institutions and the managers;

He co-ordinates the tasks of the enterprise directors and signs all the orders as well as banking documents;

He is responsible for the financial management of the enterprise;

His is the final decision in buying and selling (together with the director of commercial and administrative services), as well as the manufacturing programme (with the technical director);

He pays particular attention to the purchase of raw hides;

He does not deal with minor matters, these he delegates to higher staff personnel;

One meeting per week with the higher management staff is regarded as minimum to guarantee proper enterprise functioning.

The Technical Director:

He is responsible for production; this concerns leather quality and the quantity programmed;

He collaborates with the Commercial Director over purchases of raw materials, of chemical products to be imported, of manufacturing auxiliaries;

He keeps contact with the maintenance engineer (repair of machines and installations);

He collaborates with the chemist over the control of chemical formulae and the leather manufactured;

He superintends the direct manufacturing personnel.

The Administrative - Commercial Director:

He is responsible for production planning and timing (in collaboration with the Technical Director);

He works out the monthly production tables;

He works out the annual balance sheet (end-of-year);

He is responsible for purchases of all kinds (for direct manufacture and others);

He manages the administrative and commercial services;

He maintains contact with the customers and is in charge of marketing;

He controls the employed personnel (administration);

He directs shipments (exports and local sales).

The Laboratory Chemist:

He is responsible for chemical and physical controls;

He maintains contact with the supplier of technical assistance for research and development;

He establishes the chemical formulae for production (particularly for dyeing and finishing);

He supervises the stocks of chemical products and assists the Technical Director in their replacement.

The Maintenance Engineer:

He directs the maintenance personnel (machines and civil engineering);

He supervises repairs;

He is responsible for supplies to the enterprise (steam, electricity, water, gas, compressed air, others);

He establishes lists of spares for replacement and controls the "stock index" as well as consumption (quantity and value);

He is in permanent contact with the Technical Director (good functioning of machines and installations) and with the Administrative Director concerning orders (material)

He is responsible for rolling stock (maintenance, lubrication (greasing), replacement);

He maintains contact with the electricity and fuel (gas) suppliers;

He is responsible for the waste water purification station.

Medium staff

Technical Manufacturing Assistants:

The technicians, who direct the wet and dry departments, are responsible for the manufacturing process; they deal with the application of chemical formulae and machinery operations;

They give orders to the foremen of each section;

They supervise the quality of the leather produced (stage-by-stage);

- They remain in permanent contact with the Technical Director;
- They direct the supply for their work area through the chemical product stocks;
- They are responsible for the technical aspects of the manufacturing plan (see planning-timing);
- They supervise the output and productivity in manufacture.

The Foremen for Manufacture:

- They are the section-heads and direct their manufacturing personnel;
- They supervise proper execution of operations;
- They are responsible for the cleanliness of the machines, installations and production shops;
- They inform the Technical Assistants about any anomaly with the machines;
- They are responsible for the polyvalent work of their personnel;
- They transfer workers within their section according to production demands;
- They should collaborate amongst themselves to guarantee normal manufacture.

The Foremen of the Maintenance Service:

- They aid the engineer;
- They are responsible for quick repairs (mechanical and electrical repairs);
- They insure the maintenance of production and distribution installations: water, steam, electricity, compressed air, gas;
- They control the consumption of spares, of lubricants, others;
- They supervise the condition of rolling stock and its functioning.

The Storekeeper:

- He is responsible for the stocks of chemical products and for their replacement in good time to agree with delivery terms (imports);
- He is responsible for supplies for manufacture;
- He supervises wastes and their stockpiling, as well as freight and transports;
- He keeps the card index (quantity and value) as a means of consumption control.

The Head of the Purchasing Service:

He is responsible for the organization and execution of ordered purchases (ordered by the management);

He is in permanent contact with the financial service and supplier's accounts;

He maintains contact with the local suppliers and - in case of need - with foreign suppliers;

He is responsible for the opening of offers;

He keeps the classification of documents in large groups and supply categories (material, chemical products, tools, etc.) up to date;

He arranges transport (on orders by his superior or by his own initiative).

The Head of Sales Services:

He is responsible for the organization and execution of sales, ordered by the management;

He is in permanent contact with the storehouse, with deliveries and with customers accounts;

He maintains contact with the local customers and - where need arises - with foreign customers;

He is responsible for the supervision of the invoiced sales prices in accordance with the rates established by the management;

He keeps document classification by client up to date, according to country and schedules (in collaboration with the delivery services).

The Head of Administrative Services:

He co-ordinates general accounting;

He is responsible for the personnel and social service;

He directs the invoicing and customs clearance services;

He centralizes communications (telex, telephone);

He keeps contact with the technical assistants, the heads of the purchasing and sales services and chief of all, with the guards (gatekeepers, clocking of punch cards for payment according to personnel presence and performance).

CHAPTER IX

Project development

1. General information

The realization of a tannery project can be subdivided into a number of phases. The beginning of one phase must await the finalization of the one preceding it. This obvious necessity is nevertheless often scoffed at, causing serious misunderstandings and expenses not previewed in the initial budgets.

The first phase consists of case studies of initial feasibility or feasibility and others. If they may be imputed to the project, they can be entered into its budget. These studies are often conducted by experts or foreign organisms working with the project and often become unfortunately unwanted objects for those who are to execute them. The ideal solution would be the one associating the future partners and upper management in its elaboration. The duration of this phase, if it is contained in the expiry period of the project, will always pose a problem, because a tendency exists to "pressure" the performers to finish within a certain period. A well made study should not be limited in its necessary and normal development.

A second phase is the starting up of the project and its installations. The starting of the project depends on the decision to be taken after the basic studies have been executed. This varies from case to case, since the criteria for a politico-economical decision are very different from one country to another. There is an advantage, either to link this party with the preceding phase, although this may seem illogical, or to exclude it from the calculation of the execution period. The erection of a tannery is obviously greatly dependent on the material supply conditions. If the project had been well prepared, it should not take longer than 15 months, so that the financial planning should not be too greatly disturbed.

The third phase of establishment of the production tool could vary between 6 months and several years. If assistance (joint venture, etc.) is given, the lower limit should prevail. On the other hand, without any previous industrial planning, the start-up could be delayed indefinitely, never to take place, which could cause irreparable damage.

The fourth phase is one of normal production.

The upper management should be present on the site at the beginning of the second phase at latest and if possible earlier.

2. Realization

The realization of the project can be undertaken according to a PERT-analysis or any other planning method so as to increase precision. It is - in any case - an advantage to be able to calculate in advance the losses due to possible delays, because this will sensitize all those responsible, who have something to do with the project. This must also be seen as a tool for financial accounting, because any delay will be equal to a loss of money.

3. Follow-up expenses

Each phase has its own budget and has to be concluded by a profit and loss statement (though relative), so as not to lose sight of the financial aspect of the commitment. Very often the best projects are lost in their initial phases, due to bad calculation of the diverse costs of investment, of the hidden, non-previewed expenses or wild expenses and due to time-losses from administrative constraints and others. A supplier, who does not deliver a material within the period of his delivery contract (and if this period was previewed within the general framework of the project), ought to be held responsible: more - his responsibility must be quantified.

At the birth of an enterprise it is a good thing to submit it to an audit by a specialized and neutral society. Such operations, often demanded by banking institutions and financiers, increase the operational expenses and can thus be previewed. But it may be even more advantageous to carry these expenses over to an account of first investment, repayable according to instalments (variable according to the legislation in force), which will have consequential effects on the sales product, particularly at the beginning of operations, when the competition situation is likely to be delicate.

CHAPTER X

Financial analysis

This chapter constitutes the most sensible and vulnerable point of a tannery study. The technique is known and does not pose any feasibility problem. What makes its writing down difficult, are the following points:

Analytical transparency,

Exact establishment of the flow of payments and receipts.

A classical financial analysis is known with specialized institutions and is not absolutely necessary in this study. But the two points following merit more attention.

1. Analysis transparency

A financial analysis of "classical" type remains certainly necessary and it might even be dangerous not to execute it because of various legal, fiscal reasons and because of (financial) tax accounting practices. This procedure must not be shown to the management staff, because they are not necessarily experts in tax procedure, in the true problems inherent in the tannery industry. For this reason it is recommended to establish time-tables of payments and receipts.

Some fundamental remarks must be made.

- Raw hides: because of various factors of the international economic cycle and of the availability of the material, raw hide is a raw material with great fluctuation and speculation. It will constitute 50 to 60 per cent of the cost of the finished product, which is to say that stockpiling will be very expensive and that operating funds will have to be high. It is not at all rare to observe variations of world prices between (x) and (x + 150%). This demonstrates the importance of disposing of raw material locally and even more to be in possession of national markets regulated for raw hides, so as to stabilize prices at the maximum. The world raw material situation is always very mobile, obliging the tanners to perform miracles of imagination and flexibility to avoid jumps in operational funds required, which will be difficult to finance. That is why it is difficult to recommend projects that do not dispose of a national supply of raw hides.

- The finished product: compared to the international market, the problem of the sales of finished goods is as dramatic as that of raw hides. A finished leather will always depend on the quality of the skin from which it is made. But even if it is of good quality, its value might be severely reduced if it stumbles into the pitfalls of fashion (manufacturing delays, rectification, transport). This problem might be reduced where placement on the national market is assured, but this presupposes a well-done and permanent market research and analysis. Competition on the international market is therefore very risky and should not be undertaken, except with the aid of true specialists with access to the markets.

It is well known that the authorities of all the developing countries have expressed their dissatisfaction with regard to leather-industry projects and that many of these enterprises function very badly and with losses. This is due to the lack of foresight and of measures to prevent a break in:

- Knowledge,
- Stocks,
- Financial means.

Any producer of a tannery project must submit to this test of courage and the risk ought to be kept to a minimum. Before support can be given to any national policy on raw hides, firmly and with stabilizing effect, any forecast regarding the future should be delayed for several months. The system of a flow of payments and receipts will give better opportunities for the incorporation of flexibility in time. It will then be possible to account for seasonal fluctuations in purchasing and selling.

2. The flow of payments and receipts

For the reasons cited above it will be important to describe this flow with as much precision as possible and to include sufficient reserves and precautions. The following enumeration is only exemplary:

2.1 Expenses

- Terrain and site
- Civil engineering
- Technology (know-how, engineering, assistance)
- Equipment

Current expenses:

- Raw hides
- Chemical products
- Water
- Electricity
- Fuel and auxiliaries
- Personnel costs
- Maintenance costs
- General expenses
- Sales expenses

Tax charges.

2.2 Receipts

3. Other financial parameters

Taking account of the preceding, it is obviously necessary also to calculate other financial parameters, such as:

- Internal rentability rate
- Residual value
- Real value
- Returns in their various aspects, etc.

Conclusions and recommendations

The feasibility studies criticize the field of leather and of leather transformation quite a lot. This is due to the fact that this sector is confronted by two elements difficult to specify in exact and precise terms:

The raw material raw hides, which changes with every single animal and the apparent quality of which is not immediately "measurable";

The finished product dependent on fashion to the greatest extent and requiring the greatest flexibility of the producers and an excellent adaptability of the technology used.

It is therefore absolutely necessary for every project to undertake a basic study of all the details. The feasibility study must give greatest attention to the problem of raw hide and the correct determination of the quantities and qualities of the leather produced.

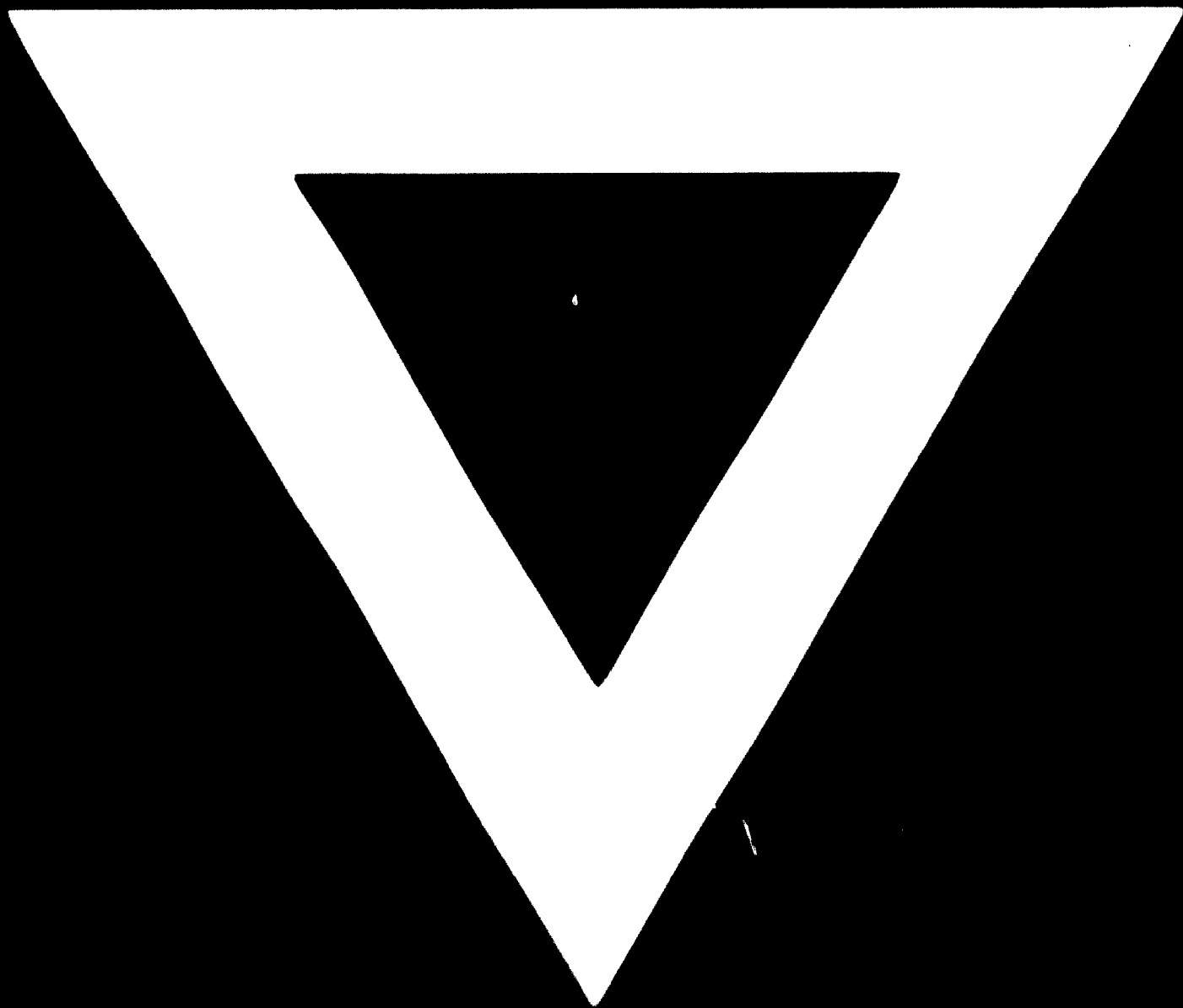
In the case of raw hides it is strongly recommended to make use of a national production and to base oneself on it on the level of cattle-rearing and slaughtering to ameliorate quantity and quality. Where imports need to be envisaged for reasons of quantity and quality because of a momentary lack of supplies, it would be preferable to acquire "wet-blues" or crust, semi-finished products, whose quality can be more easily defined. It seems better to support previsible and controllable losses than unforeseeable losses that could upset the whole production plan.

Concerning the finished product, a perfect knowledge of the market must be regarded as a conditio sine qua non. It is always recommendable to undertake the greatest number of studies with the available raw material, so as to know better what can be supplied by the various segments of the intended markets. If the international market is aimed at and there is need to dispose of an experienced and well-established commercial apparatus, it would be preferable to obtain the collaboration of a well-chosen partner, who has mastered modern technologies and possesses an established position on the market. His role may also extend to a knowledge of the raw material to be imported.

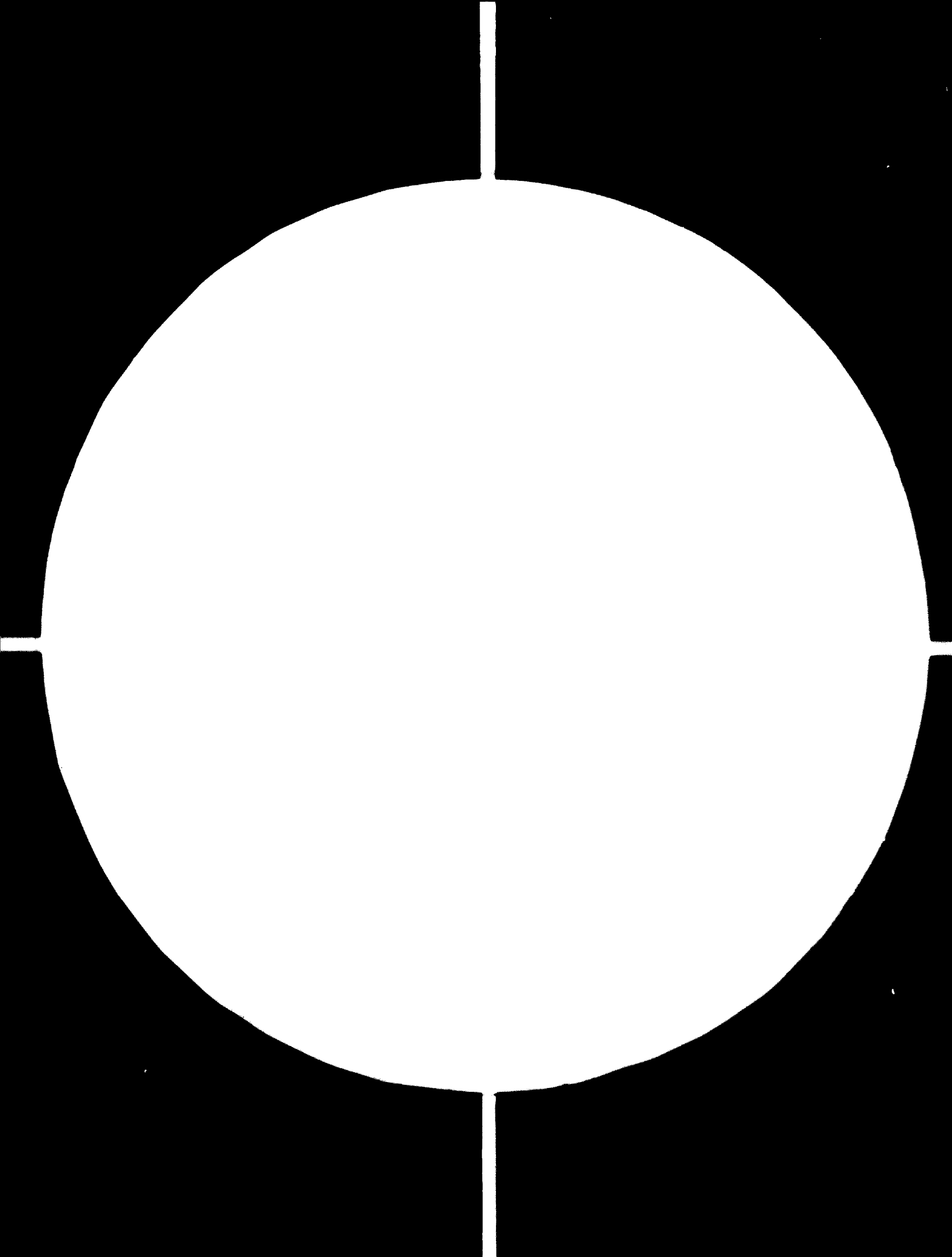
Tannage is an "experience" industry requiring a great deal of prudence and circumspection. Profits will arise only slowly and with very low margins. The attempt to short-circuit some phases will assuredly lead to disaster.

For the purpose of this study, the following
variables were selected: (1) the number of
children in the family, (2) the sex of the
children, (3) the age of the children, and
(4) the social class of the family.

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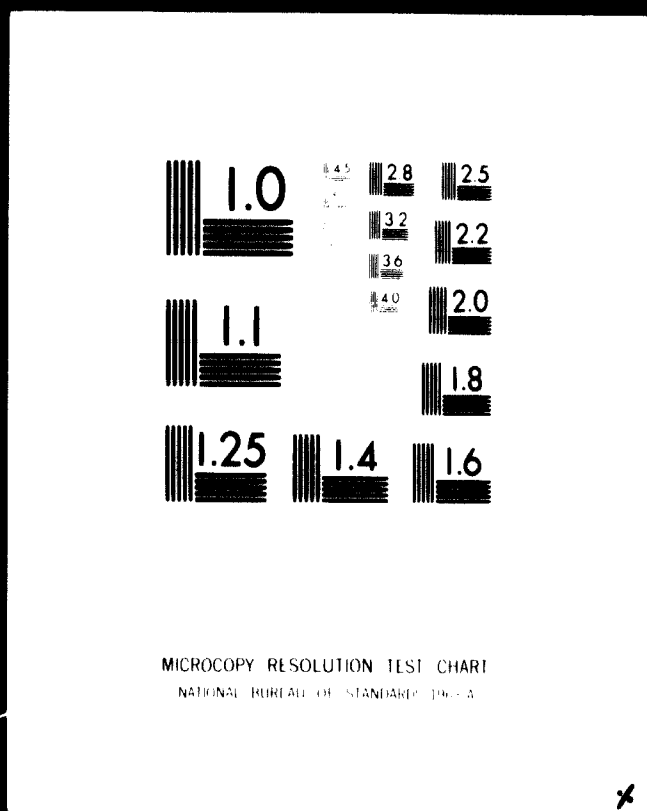


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ESTABLISHMENT OF A LEATHER AND SKIN-PROCESSING
INDUSTRY IN DEVELOPING COUNTRIES*

presented during the Inter-Regional Seminar on the
Generalized Preferential System (GPS) for Less
Developed Countries and for Developing Countries
with medium income

Vienna, July 1979

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UNIDO Secretariat

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I. Introduction

Less developed countries with small incomes are only rarely possessors of large quantities of raw materials. In the past the only exception was for leathers and raw hides, for which these countries had been the traditional suppliers. Today it is obviously the main aim to transform as much raw material locally, so as to earn a maximum of added value.

It has been shown, nevertheless, by recent studies and in particular one undertaken by Bo Lundén, a UNIDO expert, that the establishment of processing industries for leather in the countries referred to had not produced the expected results. Realization of practically all projects had been hamstrung by the same obstacles everywhere, that could be concretized in one term: feasibility.

UNIDO has published a Manual on the Preparation of Industrial Feasibility Studies that is perfectly applicable to leather. Although this booklet does not offer any solution applicable to the problem incumbent on the establishment of tanneries throughout the world, development to realization has been greatly simplified by the introduction of a systemized method for the investigation of all the elements, which oppose the harmonious starting up of an industry that is in a continuous state of evolution. It is exactly this sequence of the work that has been chosen for the present study.

II. Relative advantages offered by countries with modest resources and those less developed

The advantages favouring the development or establishment of a leather industry in those countries concern conditions relevant to:

- Availability of sufficient quantities and quality of raw hide;
- Availability of sufficient manual labourers for a type of work not requiring a great deal of qualification;
- Availability of water in sufficient quantity and quality, as well as an opportunity to run off waste waters without any damage to the environment;
- Opportunity for the harmonious placement of the final product, either on local markets or in the international market.

The general tendency today is to shift tanning industries from the developed countries to the developing countries. This calls for the following remarks:

- The leather processing industry is strongly bound up with fashion developments. To develop fashions there is need for highly complicated technologies. A transfer of such technologies to the developing countries referred to, poses not only the question of financing, but also of professionals with the required education and expertise.
- Industrialized countries are always inclined to satisfy a certain percentage of the demand of their own market themselves for obvious reasons of commercial dynamics. In most cases this is that sector of the market which offers the best profit, making inroads by the above-mentioned less developed countries extremely difficult.
- The possible use of local tanning materials, the supply of chemical products and, possibly, of raw hides lacking in quality and/or in quantity, always poses the problem of dependence on the world supply markets, that are - in certain cases - particularly with regard to raw hides, extremely fluctuating and speculative.

It may nevertheless be said that leather and leather processing industries offer evident advantages, if their construction and development is kept under perfect control.

III. Studies concerning tanneries

As already indicated above, this study has been drawn up in accordance with the layout of the UNIDO Manual for the Preparation of Industrial Feasibility Studies. Detailed information may be found in that document, while the case of a practical hypothesis will be elaborated alongside with this study. Such a case can only be a hypothesis, because every tannery has its own history and development. Every manufacturer has its own technology and in consequence the plans for manufacturing lines are different and specific. It is just this flexibility required for the machine equipment with regard to the continually changing technologies that makes the tannery industry so vulnerable. The greatest danger lies in those ready-for-starting industrial units that do not consider the WHOLE problem.

It is therefore useless to try to establish a "once and for all" study, applicable to all cases; every tannery requires its own study and parameters have to be redefined in each case.

Due to the above the figures used in the course of the present study must be regarded as purely illustrative and not representative for any given case.

CHAPTER I

Project synthesis

The first chapter begins with the general synthesis. For the present case and as an example, mention is made of a concrete project in a developing country. Names are omitted voluntarily.

1.1 Project promoter (chapter 2)

The project promoter is the only responsible authority. His identity is clearly and completely described. It may be a private person or a governmental institution or non-governmental, specialized or not specialized.

1.2 General project indicators

The general orientation of the project is directed towards the optimal and complete transformation of the raw material "raw hide" obtainable in the country.

Market orientation, which is the basis of this study, is centred on a 70 per cent local consumption of the finished ovine, caprine, bovine product and 30 per cent for export in the bovine and caprine category.

The economic and industrial policy guiding the project referred to, must, according to the national development plan, be a policy of full employment and of an industrial decentralization towards less secure zones. Besides, the project aims at the law for industrial promotion offering certain fiscal advantages. Lastly, the project enjoys substantial financial support (free construction site and infrastructure) by the regional authorities.

The history and the context of the project are part of the progressive migration of the leather industries from the developed countries to developing countries. Conscious of this opportunity the Government included this development in its expansion plans. Tanneries being an industrial branch, the development of which is difficult, there will be need for the co-operation of a foreign group to operate a joint venture. From this operation follows a technology transfer allowing the whole leather industry to take off. Product export is - at the same time - intended to safeguard a high level of quality, but also to gain a position in the traditional international marketplace and to earn back that hard currency expended in the purchase of materials, equipment and chemical products.

1.3 The market

Seventy per cent of the tannery production is destined for the local market and 30 per cent for international markets to be placed there by the partner company. The 30 per cent refer to 270,000 goatskins per annum and 1,000,000 oxhides per annum. The 70 per cent of the production are to supply the shoe and fancy leather goods industries and the shoe company previewed in the tannery-zoning plans.

The leather demand of the local market for 1981 (a year of full tannery production) is previewed as follows:

Oxhides	13,964,000 pieces
Sheepskins	8,281,000 pieces
Goatskins	3,491,000 pieces

excluding the previewed shoe factory.

Full leather production from local tanneries at the 1981 level will be:

Oxhides	7,000,000 pieces
Sheepskins	4,620,000 pieces
Goatskins	2,970,000 pieces

For the tannery in question, full production levels will be:

Oxhides	4,375,000 pieces (1 million pieces for export)
Sheepskins	1,700,000 pieces
Goatskins	1,125,000 pieces (270,000 pieces for export)

The initially installed capacity of the enterprise may be extended by 25 per cent by merely increasing the personnel.

Product sales are planned as follows:

- To the shoe factory, which will require 1,500,000 pieces oxhide and approximately 750,000 pieces sheepskins;
- For export, through the partner-network approximately 1 million oxhides and 270,000 goatskins.
- The rest, i.e.
 - 1,875,000 oxhides
 - 950,000 sheepskins
 - 855,000 goatskins

is to be sold on the local markets, covering a part of the gap between demand and local production.

1.4 Raw materials and others

The materials required for a tannery procedure are raw hides, chemical products, water and energy.

Ovine and caprine raw hides can be obtained locally, it being a fact that there is a surplus already being exported (see table, chapter 4).

All oxhides are to be bought locally. The origin of the raw materials is a guarantee for sufficient continuous supply.

All the chemical products required will have to be imported.

All auxiliary materials (steam, gas, water, electricity) will be available locally.

1.5 Construction site

The choice of construction site must be guided by two basic factors: the availability of sufficient water of required quality and the possibility of waste water removal without any damage either to agriculture or irrigation. The site that will best respond to these requirements will be the one where there is also an abundant labour force and where the Government intends to build a shoe factory.

The real estate where the tannery is to be constructed (2.4 ha) belongs to the Government. It will be ceded for a symbolic sum of 5,000 dollars. Two thousand dollars will be spent on tree-removal. The water required locally is also to be supplied in sufficient quantity at a symbolic price.

It being a fact that the region is one of cattle-rearing and agriculture, it has been decided by the authorities to construct a water recycling plant. This plant will have to be financed through the project and will cost approximately 450,000 dollars.

1.6 Project engineering

The project is laid out for the continuous fabrication of 10.6 tonnes/day, subdivided into 8 to oxhides, 0.9 to goatskins and 1.7 to sheepskins. A rectilinear layout has been chosen, to be constructed on a single level in mixed construction (armed concrete).

Leather manufacture will be on three distinctive lines: bovine, ovine, caprine.

The technology to be used will be that of the foreign partner, the tannery will be operated with a technology proven on the world markets.

The chosen equipment is the latest and intended for three shift use.

The investment costs will be constituted as follows:

	<u>Foreign</u>	<u>Local</u>	<u>Total in thousand FB</u>
<u>Equipment:</u>			
Production	\$ 3 000 000		
Auxiliaries	700 000		
Services	60 000	\$ 150 000	
Diverse	225 000		
Social		8 000	
			4 143 000
Transport expenses			500 000
Replacements			220 000
Assembly			350 000
Unforeseen			40 000
			<hr/> 5 253 000
<u>Civil engineering:</u>			<hr/> 2 700 000
			<hr/> <hr/>
	<u>In US dollars: \$7,953,000</u>		

1.7 General expenses and administration

Enterprise organization begins with the development of the project. It is based on two departments, the technical and the commercial-administrative, each headed by a director and supervised by the Directorate General (chairman/general director). The technical directorate supervises the manufacture, the auxiliary services and the laboratory. The commercial and administrative directorate supervises purchases, sales and administration.

The director-general is responsible to an administrative council normally designated by the company's annual meeting.

The composition of general expenses is subdivided in such a way that 50 per cent of the expenses cover the normal accounts, excluding management expenses and representation. The other 50 per cent cover management expenditure, representation, trips and missions, councils and assemblies.

General expenses amount to 30,975 dollars per month or 371,707 dollars per year and include a necessary and sufficient reserve to cover unforeseen expenses (85,500 dollars).

1.8 Personnel

The tannery will employ 257 persons, 225 workers and 32 employees. Of the employees 20 are directly linked with manufacture. Eighteen of these are qualified technicians.

The workers will be selected from the region and trained locally by the superior tannery technicians and the machine suppliers.

The foremen have already been selected and will receive technical training in tannery schools in Europe. They will receive practical training in the tannery of the foreign partner.

The other technical staff (technical direction, service engineer) will receive their practical training from the foreign partner.

Personnel recruitment will be spread over the first 23 months of the project's duration.

The cost of the personnel to be recruited before the starting up will amount to 128,707 dollars. During the starting-up period the expense will amount to 150,126 dollars. During that period (21 months) an additional sum of 34,280 dollars is previewed as hiring and training reserve.

The social expenditure is rated at 45 per cent. With full production, total personnel expenditure will amount to 621,365 dollars per annum.

1.9 Project development

Project realization is subdivided into three phases:

- A phase of installation assembly during 15 months;
- A phase of starting-up and running-in during 6 months;
- The final phase of normal production from the twenty-first month onward after the beginning of factory construction.

During the fifteenth month production reaches 50 per cent of normal capacity. During the whole of the starting up of the project the management of the enterprise is assisted by the foreign partner within the framework of an engineering and know-how transfer contract. A contract of technical assistance with the same company covers the start of production until 100 per cent.

The phases of project realization are seen to be realistic.

1.10 Financial analysis of the project

The global investment sum is composed as follows:

	<u>In US dollars</u>
Terrain and site	5 000
Civil engineering	2 700 000
Equipment	5 253 000
Technology	315 270
Expense of first establishment	631 000
Initial run funds	1 053 000
	<hr/>
Total	9 957 800

Of this sum 6,619,500 dollars will be needed during the first year and 3,338,300 dollars during the second.

During a normal year of operation the current production expenses will amount to 7,099,230 dollars, while earnings will amount to approximately 9,523,750 dollars. The difference of 2,424,520 dollars will serve to cover the fiscal charges and only during the first 5 years, the technological expenses. The rest is to cover the financial expenses and earnings.

Taking account of the payment flow during the first 17 years (2 years of construction and 15 years of life of the main equipment), apparent value will increase to 4,439,250 dollars at an interest rate of 10 per cent per annum.

The internal rentability rate increases to 18 per cent.

CHAPTER II

Historic and basic data

To assure the tannery's final success it will be necessary to show its importance and the position it will occupy in the national leather sector, as well as the country's industrial concept. A detailed description of the historic development of the idea to develop the enterprise will supply the necessary explanations, but should include a complete enumeration of investigation and pre-investment expenses. These are very often passed over in silence, leading to severe "hidden" expenses arising during realization.

2.1 Project background

Precise establishment of the following basic data:

- Local availability of raw hides with complete statistics of cattle-rearing and slaughtering, as well as the collecting-recovery rate;
- Long-term water resources (20 years minimum).
- Availability of labour;
- Availability of terrain;
- Global indication and localization of markets.

In all statistical elements or projections it is important to obtain total assurance of source reliability. This reliability must be undoubted.

2.2 Project promoters

A simple listing of promoters is not enough. A systematic study of the financial, economic or social situation of the promoters or partners serves to show the real situation of the future enterprise. It will also demonstrate project limitations due to the promoter's diverse possibilities or limitations. It is always recommended to associate with the following as partners:

- Raw material suppliers: cattle-farmers, slaughter-houses, collectors;
- Financial sources. banking establishments, development banks, agricultural credit banks, industrial credit banks, etc.;
- Where possible technological sources: joint-venture partners supplying know-how and access to interesting markets;
- Where possible partners with a position in the market: processing industries, foreign distributors.

2.3 Project history

Very often a goodly number of studies has been done on a country or region. A study of these previous investigations may avoid serious errors. Here it is also important to include sectoral studies and national plans so as to establish a concordance of project reviews with the national strategy (e.g. job creation, investment per created job, etc.).

2.4 Studies

This part is not only important in the list of studies to be undertaken, but also with regard to the expense caused by them. For engineering and initial know-how transfer foreign intervention will often be necessary and will probably cause very important currency expenditure. A correct and rigorous assessment of the technologies needed may achieve important savings. The cost of these studies is a part of pre-investment expenditure and may be evaluated as amounting to between 1.0 and 3.0 per cent of investment costs.

CHAPTER III

Installed capacity and the market

3.1 Study of demand and capacity in the market envisaged

The product determines the technology and also the equipment to be used. This is of prime importance in making a choice of manufacturing equipment and in the whole project conception. Very often it is - however - paid little attention to because the manufacturing programme is only defined in the vaguest of terms and very generally, e.g., fabrication of small hides, manufacture of oxhides, etc. It is also true that even more often the market aimed at is not yet very developed or little is known about its absorption capacity for a more closely defined product.

Here we should consider two cases frequently met with.

3.1.1 The national market

It is insufficient to define types of manufacture in the very vague manner alluded to above, therefore, taking account of the raw material available, a subdivision ought to be undertaken according to the uses envisaged; for instance: leather uppers, sole leathers, morroco leathers, etc. Such a listing must obviously take account of national needs, so as to avoid materials that cannot be used in the country at all. But immediately and according to classification proper processing types have to be defined: flexible leather, lining leather, sandal leather, leather for working articles (working aprons, window cleaning leathers), leather for morroco goods, leather for handicrafts articles, etc. A market study must always be undertaken in depth and systematically, so as to know the real requirements, taking account also of socio-economic factors of great variety. It is very often useless to plan the costly production of pure aniline leathers, because there will be no local customers for such an expensive product. Looked at from another angle, the manufacture of such leathers would require a type of raw material and a relevant technology, that will probably not be available locally. The search for a marketing strategy is therefore of the greatest importance and unfortunately there cannot be a universal model for such a search; every market has its own defined identity. A certain number of principles must nevertheless be regarded as essential.

- Market studies

- Perfect knowledge of verified statistics;
- Selection of an applicable research method;
- Determination and exact localisation of the planned product;
- Exact knowledge of present and future demands;
- Possibilities for launching a product in the market.

- Sales planning

- Description of sales programmes with alternatives;
- Justified selection of determined programme;
- Justified selection of a marketing strategy.

- Sales revenue

- Based on the above data sales income should be assessed.

- Commercial expenses

- Calculate sales and distribution expenses.

3.1.2 The international market

Aiming at the international market one must possess mastery of all the mechanisms of international marketing. Such mastery may be acquired in two different ways:

- Acting for one's own account;
- Using the sales network and the commercial installations of a well-established partner.

Whatever the method chosen, there will always be a need to apply technological know-how to local conditions, i.e.:

- Perfect knowledge of fashion and demand in the market aimed at;
- Material flexibility of production means;
- Continuous updating on new manufacturing processes,
- A judicious choice of raw materials;
- Rapid reaction to demand;
- Fast transport, available and subsidized;
- Proven quality mechanism.

If on the one hand acting for the enterprise account offers greater immediate freedom and avoids the always delicate problem of remuneration (royalties and otherwise) and being able to draw on the better part of production at any time, there is - on the other hand - with the choice of a partner, in whatever firm, a better guarantee of technological and commercial support, under the condition - of course - of a well-considered co-operation contract, requiring careful editing and continuous control during its execution. Mastery of a market is an exercise requiring not only years of intensive study, but also continuous prospecting and requiring the use of an imposing commercial apparatus, which is often very expensive. Such an effort may often be too much for a developing country, not only due to questions of training, but also for reasons of industrial logistics.

3.1.3 Market capacities

It is vital to know the exact capacities of the markets aimed at. As they become more and more accessible, competition will become always sharper. Under such conditions it will be very important always to possess alternative solutions. The choice of product for local markets will always have to take account of socio-economic factors, so as to avoid productions not suitable for local consumption.

3.2 Production programme

After determination of the needs of various markets and a study of the available raw materials it will be necessary to establish a production programme. This is to be used as the basis for an acquisition plan for manufacturing material. This will allow the establishment of the level of initial and intermediate stocks of material and products so as to allow a maximum of manufacturing flexibility. It will also allow the definition of the technical parameters of the enterprise and its permanent viability. In tannery production environmental impact is very important and the choice of technology and of the production programme will largely influence the resulting degree of pollution. If the above parameters are chosen carefully, this will allow an important reduction of the harm caused by pollutants and will reduce the expenditure and costs caused by purification stations. Investment costs of these stations will be discussed in chapter 5.

3.3 Production capacity

Most of the studies concerning tanneries in developing countries refer to a production of over-capacity. This installed surplus capacity is due to erroneous assessments of various kinds:

Imperfect knowledge of the national supply potential in raw hides:

Over-estimation of the demand for leather:

Ignorance of the required quality levels:

Over-abundance of production equipment supplied under a 'ready-to-start-up' system;

Lack of sufficiently trained management personnel.

Such a situation is very detrimental to the project's future, because it implies a blocking of sizable financial means due to meaningless investment and the availability of never used equipment.

The general rule to be adopted for an evaluation of the capacity to be installed:

Raw hides in sufficient quantities ought to be available locally:

Such a quantity of skins could be calculated as:

100,000 oxhides (or equivalent in smaller skins) for each industrial unit,

20,000 to 100,000 hides (or equivalent in smaller skins) for semi-industrial units using less developed tanning methods,

The quality of raw hides must be evaluated carefully, so as not to over-estimate the quantities really suitable for industrial processing.

CHAPTER IV

The need for tannery raw materials

4.1 General

A tannery processes the raw hides coming from the slaughter-houses into finished leathers likely to be of interest to a large group of manufacturers of leather goods: shoes, morroco-leather goods, etc.

To achieve such a product, the initial choice of raw skins (hides) is of overwhelming importance, because the quality of the finished goods can rarely be better than that of the skins. As with all industries, the processing of skins requires energy. Electricity powers the machines, steam is used for drying and for the production of hot water. Water consumption is important. Part of the water used is polluted and effluents have to be treated and purified.

4.2 Raw hide

The types of leather to be manufactured, or what is called the collection, obviously depend on the demands of the market. It is therefore necessary to find a golden mean between those demands and the real quality, in the required quantity, of the raw hides available. It is therefore very important, not only not to over-estimate availability, but also to define the characteristic properties, such as dimensions, thickness, skin structure and grain character.

These evaluation elements also depend on a number of other circumstances, such as race, climate and rearing conditions. It is indispensable to review all these factors so as to know the exact raw hide availability situation. Reliability of statistical data is often questionable in many countries, not only due to the difficulties of information collection, but chiefly because of the subjectivity of the collector's observations. In any case, projects for the creation of tanneries should in all cases be accompanied by programmes for the improvement of raw hide quality.

Importation of skins should be avoided as far as possible, for the following reasons:

- Excessive expenditure of hard currency;
- Highly speculative markets;
- Growing supply difficulties;
- Lack of knowledge of the real nature of the imported product;
- Transport delays that may influence the quality (conservation).

Imports may only be justified where there is a lack of stocks or where a certain quality is required for a specified type of finished goods.

4.3 Chemical products

Chemical products used in tannery can be subdivided into three groups:

- Heavy chemical products: for the real tanning process. These are principally lime in powder form, acids, alkalines and for the tanning, tannines (chrome salts, synthetic and vegetal tannines). Among them there are products which might be purchasable locally or for which local production plans might be envisaged (acids/alkalines):
- Dyestuffs and foodstuffs are used in dyeing. Except for some foodstuffs (animal fats), all have to be imported;
- Finishing products. These are highly specialized products, giving leather its final characteristics and the aspect desired. Generally these will have to be imported and they involve a high degree of technological development. The producers themselves usually offer assistance for the application of these technologies.

The supply of these products often requires long order periods and therefore sufficient stocks ought to be laid in. However, accumulated stocks also bind important capital and what is even worse, cut down flexibility in production. In any case, it will be necessary to lay in stocks of the above sufficient to last for two to four months of production.

4.4 Sources of energy

These are to be obtained locally. To assure continuous supply sufficient stocks have to be assembled, as well as an emergency electricity plant to supply energy when the mains network breaks down. Water is an extremely important problem and technologies have to be chosen using least amounts of water. Water consumption per kg of hide processed should be approximately 35 to 45 litres.

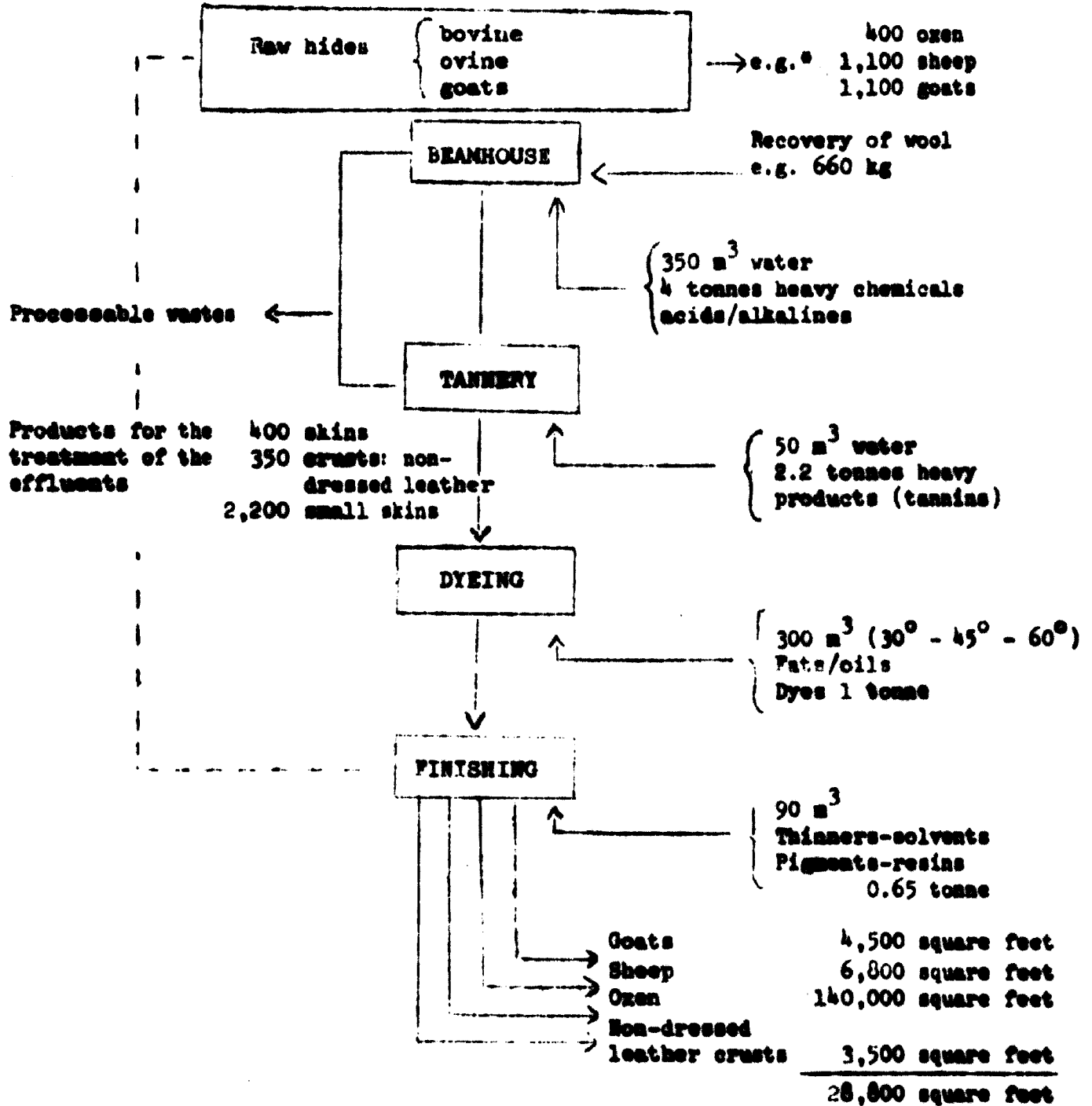
4.5 Supply programme

The supply programme must be rigorously based on the production plan. This is not only a matter of organization, but also of financing, because interruption of supply is as serious as the piling of excessive working stocks.

4.6 Waste materials and effluents

Solid wastes (scrap, dry and wet wastes, trimmings, cuttings, shavings) require special studies. They can easily be utilized in secondary industry (reconstituted leather, paper making, fertilizer). Effluents pose a more difficult problem, which will be treated separately.

Scheme of daily inputs and outputs



* The above is merely an example under the restrictions mentioned before.

CHAPTER V

Building site

The choice of a site for a tannery is influenced by a number of factors. In advance it is difficult to tell which of the factors will be the most important, because this will depend on the local conditions and the possibility of adapting these conditions to industrial needs. The availability of water in sufficient quantity and quality and the possibility of draining the residual water will be a demand valid for all the possibilities.

5.1 The site

Tannery is a light and polluting industry, wherefore it is necessary to choose a real industrial terrain. A tendency exists to remove tanneries to desert sites. This is not, however, any solution to the pollution problem, but a crushing load for the project. On the other side, a really industrial environment would solve most of the infrastructural problems. The cleaning of rejects of whatever kind is more of a national than a regional problem, which an individual enterprise cannot solve by itself.

5.2 Climatic conditions

Climatic conditions have a greater influence on men than on the product to be processed, if the technologies are seen to be largely adaptable. Their most immediate effect is on the types of construction envisaged and the more the climate is favourable, the more will it be possible to plan light structures or work in the open air.

5.3 Social data

Tanneries do not require specially qualified personnel and most of the workers will be simple stock handlers. Only the machine operators, the foremen and the management staff will be more specialized.

The social aspect linked with tannery site selection requires accessibility of the enterprise through classical transport means, as well as its integration in a normal socio-cultural system favouring a sound industrial climate.

5.4 Fiscal and legal data

Various countries interested in industrial development often take fiscal measures to activate the rhythm of investment. Such measures should be carefully evaluated so as not to over-estimate the advantages. Their impact must be calculated with precision and reflected in the financial calculations. The team undertaking the project feasibility studies must include a legal expert to calculate all the advantages to be gained in the financial, administrative and social domains.

5.5 Environmental impact

Environmental protection has become a preoccupation of the Governments of all countries. In the western world many tanneries have shut down because the problem of water residues proved insurmountable. Can we merely transfer these problems to the developing countries? Certainly not! But it is important to realize that the application of simple tanning techniques and the availability of space reduce the problem within reasonable limits. Even further: it is impossible to draw up a standard procedure applicable in all cases. The struggle against pollution begins on the workshop level, where one has to try to reduce water consumption, as well as to try to produce as few sulphur pollutants as possible. Recycling of the baths is a means to reduce the pollution rate of the effluents, but the technology is not always accessible and the size of the tanneries not always big enough. With regard to mechanical, chemical or biological treatments there is always the need for extensive local studies so as to avoid heavy investments without any yield for the final product.

CHAPTER VI

Project engineering

The extent of the project encompasses not only activities in the works, but also all the inputs, the outgoing products and all annexed activities. Such a global approach allows the assessment of a real and global sum of investments and to determine what these will support, when and how. Having defined the construction of the enterprise and the technology envisaged, it will be necessary to establish the type and number of equipment in agreement with the productive capacity required. The cost of the equipment and of its technology has to be defined. The cost of all the construction work and of the annexed activities needs to be estimated on the basis of concrete offers or assessments.

6.1 Extent of the project

Very often plans for the erection of a tannery are limited to a ready-for-operation enterprise. During the project execution a goodly number of activities and subsequent expenses will arise, which were not previewed and which condition the good operation of the enterprise. It is necessary to undertake a detailed study of the local situation to avoid such surprises.

From the point of view of the enterprise's production activities we have to consider everything which went before (or purchase services) and everything which follows (or sales service and after-sales service).

-- Auxiliary services before production

It is not possible to limit activities to a simple purchase of materials and products, but we have to be equally concerned with the economic determination of the stocks necessary. Local supplies often require a technical assistance, which -- even if it does not encumber the tannery, is a charge on its budgets. It will be better to assist the cattle merchants and the hide collectors so as to obtain raw hides of acceptable quality than to suffer production losses due to raw materials.

The danger of ready-to-operate objects, whose design is influenced by the industrial environment experienced by the designers and who do not take account of the local realities. Often the greatest economy to be obtained from such objects is to shut them down and throw the keys as far away as possible!

- Auxiliary services after production

A complete sales service must be organized to allow a systematic study of the local markets. For the international markets it will be more difficult to establish an adequate organization. Very often associations are formed with partners for this purpose, who possess appropriate sales services. It is necessary to obtain a transfer of practical know-how in this field and the cost calculated for this and related items. After-sales services are also necessary and the same applies with regard to assistance, as was noted with regard to the purchase services.

- Technology

The chosen technological procedure has to be described in every smallest detail. Such a description allows a justification of the choice and the amount of equipment and the calculation of the costs. Here again auxiliary services are numerous and vary from one country to another. It is not enough to indicate a technical or maintenance service.

The minimum parameters to be defined are:

The field of activity taking into account the industrial environment,
The possibilities of recruitment and training of specialized personnel,
Material and human reserves sufficient to assure proper functioning of the production machinery.

It is also basically necessary to describe how and when the technology is to be acquired. Tannery operation requires a certain experience and chief of all great technical flexibility. External know-how needs to be obtained in various forms and in particular:

Through assistance engineering,
Know-how transfer,
Technical assistance, licensing, etc.

The following is usually included in assistance engineering:

Planning: material requirements and necessary equipment,
capacity requirements,
choice of type of construction.

Rough drafts and layouts

Definition of production equipment

Follow-up and general supervision.

With regard to know-how transfer, the aim is to produce articles of good quality and always a quantity sufficient to guarantee the enterprise's rentability. In view of the different conditions found in different countries and also in each region of a country, the essential point of know-how is the adaptation of the technical and chemical processes to the conditions obtaining on site.

It is not sufficient - in this regard - only to rely on documentation in the form of basic chemical formulae and a range of operating descriptions with simple data concerning machine control, such as speed, pressure, temperature and other data.

The combination of atmospheric conditions, the quality of industrial water supplies and particularly the quality of the hides to be processed, will demand a modification of the chemical formulae and the execution of a series of measures to ensure high product quality.

Amongst other things technical assistance can consist of:

- Research and the creation of a collection,
- Realization of new formulae for these collections,
- Search for technical documentation,
- Supervisory work,
- Establishment of training programmes.

6.2 Equipment

Equipment needs to be chosen with regard to the technologies to be defined. For this reason, it will be impossible to predict which type of machine will be preferable to which other.

The following items will exert an influence on the choice:

Delivery periods,

After-sales service by the supplier,

Relative simplicity of operation and maintenance,

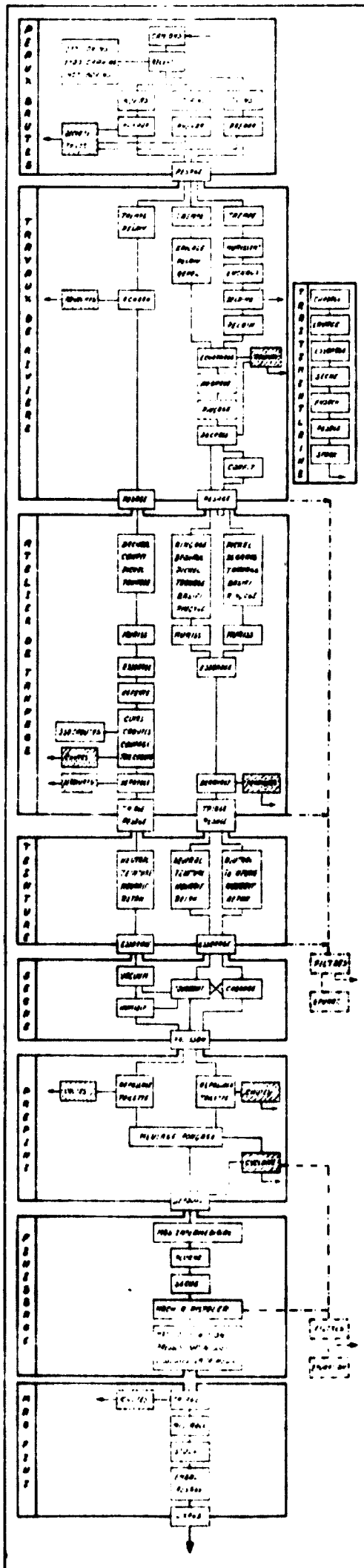
Guarantee of spares availability,

Modalities and costs of machine installation.

Very often the purchase price of a machine will double after installation because of local difficulties, etc. It is necessary to estimate these elements from a solid basis, so as to avoid unpleasant surprises.

6.3 Civil engineering

Construction has to take account of conditions on site and the equipment to be installed. It will often be difficult to obtain an industrial infrastructure, if the neighbourhood of an equipped industrial zone is not included in planning. If this cannot be obtained, it will be necessary to be extremely prudent in cost estimating.



CHAPTER VII

Organization

A tannery enterprise can be organized in various ways. Even where precise data of a tannery are available, there are always several ways of organization possible. It would therefore be wrong to adhere to any rigid scheme. Complex organization should be avoided, because it will make the development of orders and decisions long and irksome.

Description and definition of positions in the organization has to be exact, all the way from the director-general down to the last manual worker. This is a hard job, but it is the only way to avoid overlaps, functional incompatibility and badly made decisions.

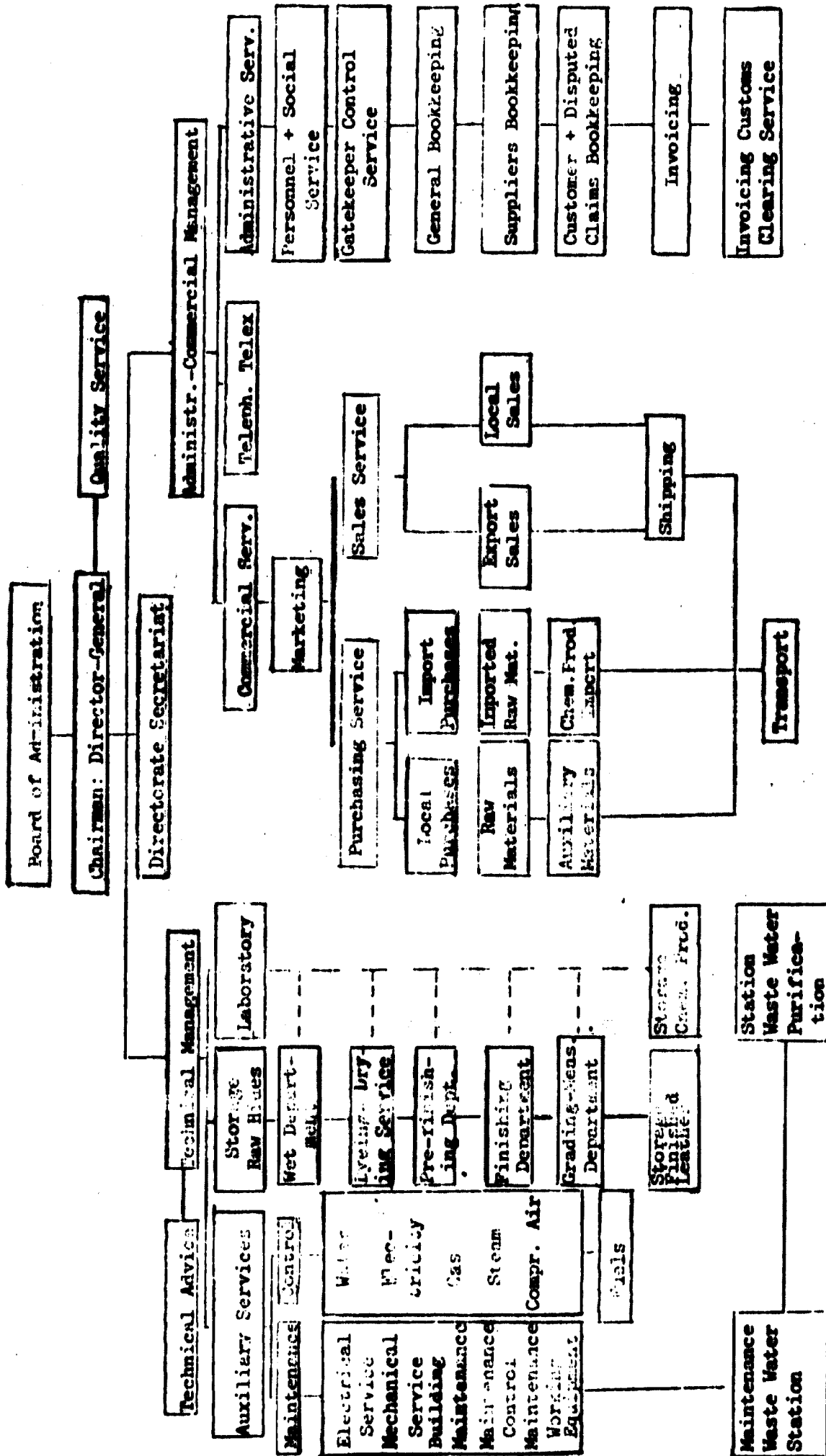
From the moment project execution begins, works organization must be supervised by the director-general and the technical manager. Organization structure will be extended and realised as the project advances.

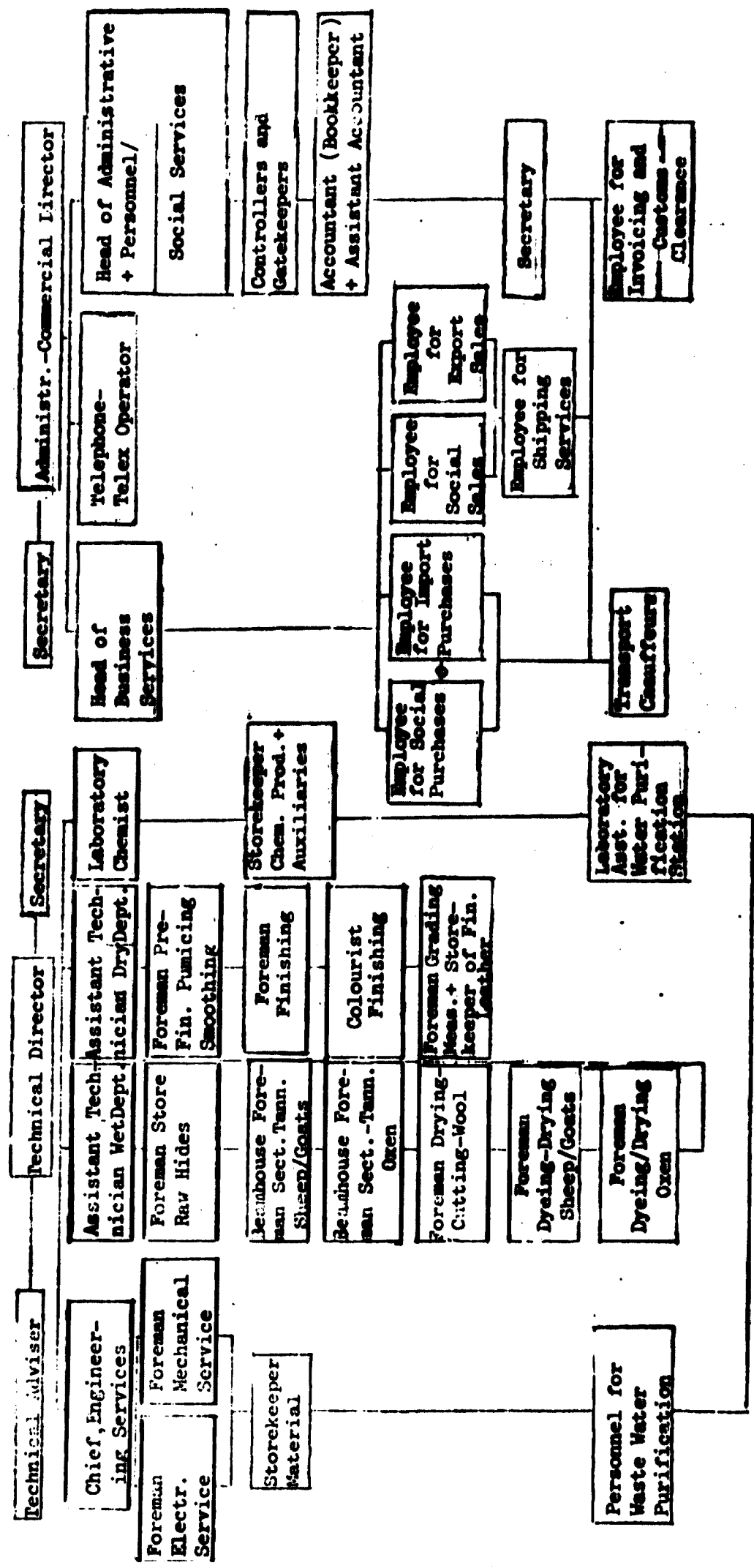
Organization may be based on two managing departments headed by one managing director each and supervised by a directorate-general.

Technical management is to supervise manufacture, the auxiliary services and the laboratory. The technical manager supervises a certain number of senior technicians in the dry and moist departments, a maintenance engineer and a laboratory chemist. This last expert is also responsible for the treatment of pollutant waste water in the purifying station. Manufacturing technicians are assisted by the foremen. The engineer is assisted by the foremen in mechanical and electrical requirements.

Administrative and commercial management supervises purchases, sales and administrative measures.

Organization





CHAPTER VIII

Personnel

1. Employment

Basic data concerning the number of personnel to be employed in a tannery is highly controversial and likely to lead to confusion. Tannage is not a very labour-intensive industry, likely to increase the sensitivity of output parameters. But it is recommended to establish the rate of output by worker and time unit, expressed in square feet of leather produced. Available figures should be handled with care, because they may be influenced by numerous factors such as: social environment, professional training, climate, etc.

Although the apparent yield of direct output may seem to render a good average, overheads are able to influence the over-all output of personnel in a very negative manner. This does not refer to any replacement of machines by people, but to cost overheads.

It is therefore important to draw up a list of required personnel as precisely as possible. It is not enough to indicate a number calculated for the quotients of theoretical output, but to define the exact number of future tannery employees with the aid of organigrammes and job descriptions.

2. Cost estimates

Derived from the above-mentioned data, it is possible to calculate the direct and indirect costs occasioned by personnel. In calculating the expenses the following items must not be forgotten:

- Paid holidays and annual leave,
- Non-productive days due to apprenticeship,
- Expenses under social security,
- Social security charges for non-productive days,
- Various output premiums.

The total of the above items is rarely less than 50 per cent if calculated with precision, although the national authorities usually claim the official charges to amount to between 20 and 30 per cent. This error source must be absolutely avoided.

3. Job inventory

Personnel should be adapted to each local situation arising, but it is nevertheless possible to define some general characteristics. These characteristics can often be a help in deciding candidatures, so that the necessary training and information can be given well before the start of the project.

Higher staff

The Chairman: Director General:

He maintains contact with governmental institutions and the managers;

He co-ordinates the tasks of the enterprise directors and signs all the orders as well as banking documents;

He is responsible for the financial management of the enterprise;

His is the final decision in buying and selling (together with the director of commercial and administrative services), as well as the manufacturing programme (with the technical director);

He pays particular attention to the purchase of raw hides;

He does not deal with minor matters, these he delegates to higher staff personnel;

One meeting per week with the higher management staff is regarded as minimum to guarantee proper enterprise functioning.

The Technical Director:

He is responsible for production; this concerns leather quality and the quantity programmed;

He collaborates with the Commercial Director over purchases of raw materials, of chemical products to be imported, of manufacturing auxiliaries;

He keeps contact with the maintenance engineer (repair of machines and installations);

He collaborates with the chemist over the control of chemical formulae and the leather manufactured;

He superintends the direct manufacturing personnel.

The Administrative - Commercial Director:

He is responsible for production planning and timing (in collaboration with the Technical Director);

He works out the monthly production tables;

He works out the annual balance sheet (end-of-year);

He is responsible for purchases of all kinds (for direct manufacture and others);

He manages the administrative and commercial services;

He maintains contact with the customers and is in charge of marketing;

He controls the employed personnel (administration);

He directs shipments (exports and local sales).

The Laboratory Chemist:

He is responsible for chemical and physical controls;

He maintains contact with the supplier of technical assistance for research and development;

He establishes the chemical formulae for production (particularly for dyeing and finishing);

He supervises the stocks of chemical products and assists the Technical Director in their replacement.

The Maintenance Engineer:

He directs the maintenance personnel (machines and civil engineering);

He supervises repairs;

He is responsible for supplies to the enterprise (steam, electricity, water, gas, compressed air, others);

He establishes lists of spares for replacement and controls the "stock index" as well as consumption (quantity and value);

He is in permanent contact with the Technical Director (good functioning of machines and installations) and with the Administrative Director concerning orders (material)

He is responsible for rolling stock (maintenance, lubrication (greasing), replacement);

He maintains contact with the electricity and fuel (gas) suppliers;

He is responsible for the waste water purification station.

Medium staff

Technical Manufacturing Assistants:

The technicians, who direct the wet and dry departments, are responsible for the manufacturing process; they deal with the application of chemical formulae and machinery operations;

They give orders to the foremen of each section;

They supervise the quality of the leather produced (stage-by-stage);

- They remain in permanent contact with the Technical Director;
- They direct the supply for their work area through the chemical product stocks;
- They are responsible for the technical aspects of the manufacturing plan (see planning-timing);
- They supervise the output and productivity in manufacture.

The Foremen for Manufacture:

- They are the section-heads and direct their manufacturing personnel;
- They supervise proper execution of operations;
- They are responsible for the cleanliness of the machines, installations and production shops;
- They inform the Technical Assistants about any anomaly with the machines;
- They are responsible for the polyvalent work of their personnel;
- They transfer workers within their section according to production demands;
- They should collaborate amongst themselves to guarantee normal manufacture.

The Foremen of the Maintenance Service:

- They aid the engineer;
- They are responsible for quick repairs (mechanical and electrical repairs);
- They insure the maintenance of production and distribution installations: water, steam, electricity, compressed air, gas;
- They control the consumption of spares, of lubricants, others;
- They supervise the condition of rolling stock and its functioning.

The Storekeeper:

- He is responsible for the stocks of chemical products and for their replacement in good time to agree with delivery terms (imports);
- He is responsible for supplies for manufacture;
- He supervises wastes and their stockpiling, as well as freight and transports;
- He keeps the card index (quantity and value) as a means of consumption control.

The Head of the Purchasing Service:

He is responsible for the organization and execution of ordered purchases (ordered by the management);

He is in permanent contact with the financial service and supplier's accounts;

He maintains contact with the local suppliers and - in case of need - with foreign suppliers;

He is responsible for the opening of offers;

He keeps the classification of documents in large groups and supply categories (material, chemical products, tools, etc.) up to date;

He arranges transport (on orders by his superior or by his own initiative).

The Head of Sales Services:

He is responsible for the organization and execution of sales, ordered by the management;

He is in permanent contact with the storehouse, with deliveries and with customers accounts;

He maintains contact with the local customers and - where need arises - with foreign customers;

He is responsible for the supervision of the invoiced sales prices in accordance with the rates established by the management;

He keeps document classification by client up to date, according to country and schedules (in collaboration with the delivery services).

The Head of Administrative Services:

He co-ordinates general accounting;

He is responsible for the personnel and social service;

He directs the invoicing and customs clearance services;

He centralizes communications (telex, telephone);

He keeps contact with the technical assistants, the heads of the purchasing and sales services and chief of all, with the guards (gatekeepers, clocking of punch cards for payment according to personnel presence and performance).

CHAPTER IX

Project development

1. General information

The realization of a tannery project can be subdivided into a number of phases. The beginning of one phase must await the finalization of the one preceding it. This obvious necessity is nevertheless often scoffed at, causing serious misunderstandings and expenses not previewed in the initial budgets.

The first phase consists of case studies of initial feasibility or feasibility and others. If they may be imputed to the project, they can be entered into its budget. These studies are often conducted by experts or foreign organisms working with the project and often become unfortunately unwanted objects for those who are to execute them. The ideal solution would be the one associating the future partners and upper management in its elaboration. The duration of this phase, if it is contained in the expiry period of the project, will always pose a problem, because a tendency exists to "pressure" the performers to finish within a certain period. A well made study should not be limited in its necessary and normal development.

A second phase is the starting up of the project and its installations. The starting of the project depends on the decision to be taken after the basic studies have been executed. This varies from case to case, since the criteria for a politico-economical decision are very different from one country to another. There is an advantage, either to link this party with the preceding phase, although this may seem illogical, or to exclude it from the calculation of the execution period. The erection of a tannery is obviously greatly dependent on the material supply conditions. If the project had been well prepared, it should not take longer than 15 months, so that the financial planning should not be too greatly disturbed.

The third phase of establishment of the production tool could vary between 6 months and several years. If assistance (joint venture, etc.) is given, the lower limit should prevail. On the other hand, without any previous industrial planning, the start-up could be delayed indefinitely, never to take place, which could cause irreparable damage.

The fourth phase is one of normal production.

The upper management should be present on the site at the beginning of the second phase at latest and if possible earlier.

2. Realization

The realization of the project can be undertaken according to a PERT-analysis or any other planning method so as to increase precision. It is - in any case - an advantage to be able to calculate in advance the losses due to possible delays, because this will sensitize all those responsible, who have something to do with the project. This must also be seen as a tool for financial accounting, because any delay will be equal to a loss of money.

3. Follow-up expenses

Each phase has its own budget and has to be concluded by a profit and loss statement (though relative), so as not to lose sight of the financial aspect of the commitment. Very often the best projects are lost in their initial phases, due to bad calculation of the diverse costs of investment, of the hidden, non-previewed expenses or wild expenses and due to time-losses from administrative constraints and others. A supplier, who does not deliver a material within the period of his delivery contract (and if this period was previewed within the general framework of the project), ought to be held responsible: more - his responsibility must be quantified.

At the birth of an enterprise it is a good thing to submit it to an audit by a specialized and neutral society. Such operations, often demanded by banking institutions and financiers, increase the operational expenses and can thus be previewed. But it may be even more advantageous to carry these expenses over to an account of first investment, repayable according to instalments (variable according to the legislation in force), which will have consequential effects on the sales product, particularly at the beginning of operations, when the competition situation is likely to be delicate.

CHAPTER X

Financial analysis

This chapter constitutes the most sensible and vulnerable point of a tannery study. The technique is known and does not pose any feasibility problem. What makes its writing down difficult, are the following points:

Analytical transparency,

Exact establishment of the flow of payments and receipts.

A classical financial analysis is known with specialized institutions and is not absolutely necessary in this study. But the two points following merit more attention.

1. Analysis transparency

A financial analysis of "classical" type remains certainly necessary and it might even be dangerous not to execute it because of various legal, fiscal reasons and because of (financial) tax accounting practices. This procedure must not be shown to the management staff, because they are not necessarily experts in tax procedure, in the true problems inherent in the tannery industry. For this reason it is recommended to establish time-tables of payments and receipts.

Some fundamental remarks must be made.

- Raw hides: because of various factors of the international economic cycle and of the availability of the material, raw hide is a raw material with great fluctuation and speculation. It will constitute 50 to 60 per cent of the cost of the finished product, which is to say that stockpiling will be very expensive and that operating funds will have to be high. It is not at all rare to observe variations of world prices between (x) and (x + 150%). This demonstrates the importance of disposing of raw material locally and even more to be in possession of national markets regulated for raw hides, so as to stabilize prices at the maximum. The world raw material situation is always very mobile, obliging the tanners to perform miracles of imagination and flexibility to avoid jumps in operational funds required, which will be difficult to finance. That is why it is difficult to recommend projects that do not dispose of a national supply of raw hides.

- The finished product: compared to the international market, the problem of the sales of finished goods is as dramatic as that of raw hides. A finished leather will always depend on the quality of the skin from which it is made. But even if it is of good quality, its value might be severely reduced if it stumbles into the pitfalls of fashion (manufacturing delays, rectification, transport). This problem might be reduced where placement on the national market is assured, but this presupposes a well-done and permanent market research and analysis. Competition on the international market is therefore very risky and should not be undertaken, except with the aid of true specialists with access to the markets.

It is well known that the authorities of all the developing countries have expressed their dissatisfaction with regard to leather-industry projects and that many of these enterprises function very badly and with losses. This is due to the lack of foresight and of measures to prevent a break in:

- Knowledge,
- Stocks,
- Financial means.

Any producer of a tannery project must submit to this test of courage and the risk ought to be kept to a minimum. Before support can be given to any national policy on raw hides, firmly and with stabilizing effect, any forecast regarding the future should be delayed for several months. The system of a flow of payments and receipts will give better opportunities for the incorporation of flexibility in time. It will then be possible to account for seasonal fluctuations in purchasing and selling.

2. The flow of payments and receipts

For the reasons cited above it will be important to describe this flow with as much precision as possible and to include sufficient reserves and precautions. The following enumeration is only exemplary:

2.1 Expenses

- Terrain and site
- Civil engineering
- Technology (know-how, engineering, assistance)
- Equipment

Current expenses:

- Raw hides
- Chemical products
- Water
- Electricity
- Fuel and auxiliaries
- Personnel costs
- Maintenance costs
- General expenses
- Sales expenses

Tax charges.

2.2 Receipts

3. Other financial parameters

Taking account of the preceding, it is obviously necessary also to calculate other financial parameters, such as:

- Internal rentability rate
- Residual value
- Real value
- Returns in their various aspects, etc.

Conclusions and recommendations

The feasibility studies criticize the field of leather and of leather transformation quite a lot. This is due to the fact that this sector is confronted by two elements difficult to specify in exact and precise terms:

The raw material raw hides, which changes with every single animal and the apparent quality of which is not immediately "measurable";

The finished product dependent on fashion to the greatest extent and requiring the greatest flexibility of the producers and an excellent adaptability of the technology used.

It is therefore absolutely necessary for every project to undertake a basic study of all the details. The feasibility study must give greatest attention to the problem of raw hide and the correct determination of the quantities and qualities of the leather produced.

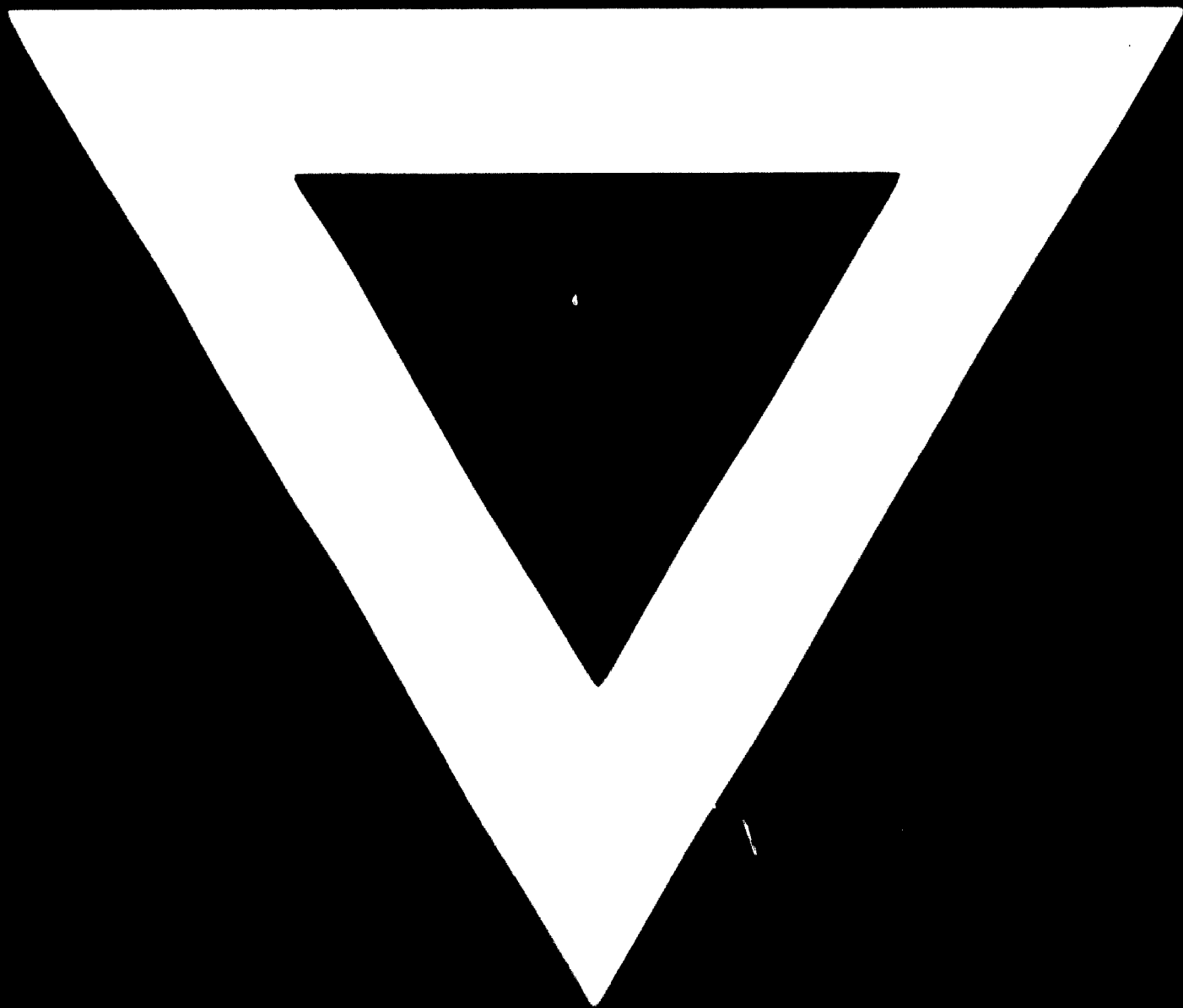
In the case of raw hides it is strongly recommended to make use of a national production and to base oneself on it on the level of cattle-rearing and slaughtering to ameliorate quantity and quality. Where imports need to be envisaged for reasons of quantity and quality because of a momentary lack of supplies, it would be preferable to acquire "wet-blues" or crust, semi-finished products, whose quality can be more easily defined. It seems better to support previsible and controllable losses than unforeseeable losses that could upset the whole production plan.

Concerning the finished product, a perfect knowledge of the market must be regarded as a conditio sine qua non. It is always recommendable to undertake the greatest number of studies with the available raw material, so as to know better what can be supplied by the various segments of the intended markets. If the international market is aimed at and there is need to dispose of an experienced and well-established commercial apparatus, it would be preferable to obtain the collaboration of a well-chosen partner, who has mastered modern technologies and possesses an established position on the market. His role may also extend to a knowledge of the raw material to be imported.

Tannage is an "experience" industry requiring a great deal of prudence and circumspection. Profits will arise only slowly and with very low margins. The attempt to short-circuit some phases will assuredly lead to disaster.

For the purpose of this study, the following
variables were selected: (1) the number of
children in the family, (2) the sex of the
children, (3) the age of the children, and (4)

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