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SweDrugConsulting

PHARMACEUTICAL BUSINESS DEVELOPMENT, MANAGEMENT AND TRANSFER OF TECHNOLOGY

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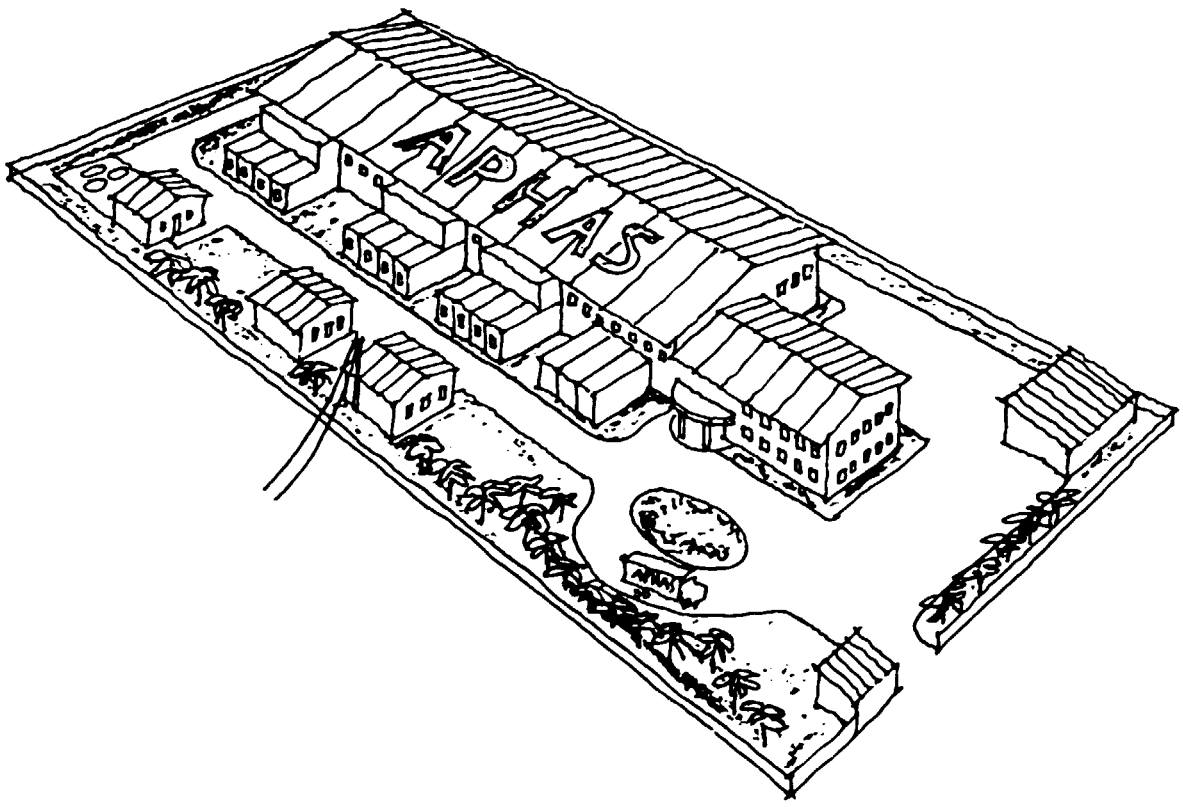

FEASIBILITY STUDY FOR PRODUCTION OF PHARMACEUTICAL PREPARATIONS IN CAMEROON

Feasibility Study for Production of Pharmaceutical Preparations in Cameroon

Project No : TF/CMR/90/001

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by

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FINAL REPORT

1990-10-19

Acknowledgements

Feasibility Study Report
APHAS Pharmaceutical Industrial Project in Cameroon

We would like to thank all those who have contributed in many ways to this feasibility study; Dr János Pogány Senior Industrial Development Officer at UNIDO, who have contributed with facts and critical analysis of our work and to whom we are very grateful, Mr Julien Dobong'na Advisor to the President of C.F.I who patiently have provided us with facts about Cameroon and introduced us to the business culture there.

We would also like to thank the staff of C.F.I who took great care of us while we were in Cameroon, Mr Gösta Lind finance director of ACO for a refreshment course in finance analysis, Mrs Inger Lejermalm at Pharmadule who did the secretarial work and all others not explicitly mentioned here.

We had a great time and wish APHAS very good luck with the project !

Definitions and explanations

TUSD/tUSD	Thousand US Dollars
mUSD	million US Dollars
'	after a figure, indicating thousands
''	after a figure, indicating millions
QA	Quality Assurance
QC	Quality Control
GMP	Good Manufacturing Practice (in French BPF)
T1/T2/T3	1st,2nd,3rd thirds of the calendar year
MA	Materials Administration
RM	Raw materials
PM	Packaging materials
Exchange rates	We have assumed 300 CFA = 1 USD
Currency	All costs, revenues and investments are related to currency values of 1989

Symbols related to pharmaceutical dosage forms:

CAP	Capsules
IPO	Powder for injection
ISO	Solution (solvent) for injection
PFR	Powder for reconstitution into oral solution or suspension
SOR	Solution for oral use
SUO	Suspension for oral use
TUC	Uncoated tablets

Feasibility Study Report
APHAS Pharmaceutical Industrial Project in Cameroun

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Chapter I

Executive Summary

I,1 The scope of work contained in this segment is abstracting all significant aspects of the feasibility study and reporting them in a succint manner.

I. Executive summary

INTRODUCTION

The necessity of a local initiative to establish a major pharmaceutical industry in Central Africa has been recognized for some years by the main promotor of the APHAS project, Compagnie Financière et Industrielle. The UNIDO has assisted C.F.I in various ways to take important initial steps to realize the project. During the last year two more promotors have been introduced into the project; Pharmadule, supplier of turn-key pharmaceutical plants and technical partner to APHAS, and Swedfund, a Swedish Foundation for Industrial Cooperation with Developing Countries.

These promotors have decided to carry out a feasibility study for the project and have contracted SweDrug Consulting AB to do so.

In the Chapters II - XII with enclosures the details of the study will be found.

In this Chapter I, an Executive Summary of the study is presented: Introduction, Summary of the Study and Normative Conclusions.

SUMMARY OF THE STUDY

II. Project background and history

The central african region, including Cameroon, is to more that 90 % dependendent on imports of pharmaceuticals to cover the needs of health care. No significant local or regional manufacturers are yet operating on these markets.

C.F.I has identified the opportunity to establish a local pharmaceutical industry to improve the availiabilty of pharmaceutical products in the area.

The main policies of the "APHAS"-project are described as follows:

* The product-profile to be geared at major health problems of Cameroon and Central Africa
* License-manufacturing of high-quality brand-name pharmaceutical specialities from reputed international companies
* Compliance with international standards of Good Manufacturing Practice
* Building alliances with existing structures and health professions
* Private enterprise
* Prioritize profitability,quality,investment cost and time in this order

III. Market and plant capacity

The size of the Cameroonian market has decreased from 37.7 bill CFFA 1986/87 to 28.6 bill CFFA in 1988/89 following several years of strong growth. The main reason being the economic crisis with drastic reduction in GDP.

There are reasons to believe that 1989/90 will still show a reduction in market size but at the same time constituting a turning point.

The growth estimates of APHAS are 6 % real growth p.a. in the first years of operation and 10 % p.a. after the initial years of establishment.

The main business strategy for APHAS is formulated as follows:

MARKET PENETRATION OF THE HOME MARKET WITH HIGH-QUALITY PRESCRIPTION PHARMACEUTICALS UNDER LICENSE AND ALREADY PRESENT ON THE CAMEROONIAN MARKET IN ALLIANCE WITH THE HEALTH PROFESSIONS AND USED IN THE TREATMENT OF MAJOR HEALTH PROBLEMS IN CAMEROON I.E. INFECTIONS, MALARIA AND PARASITIC INFESTATIONS.

From this main strategy four main product areas have been selected for which a considerable demand will prevail at least during a 10-yearperiod.

- Antiinfectives
- Antimalarials
- Antiparasitics
- OTC:s

13 pharmaceutical specialities (43 entities) have been selected from 11 major pharmaceutical industries in Europe and the U.S.A. These products are already registered and available on the market.

The combined sales in Cameroon of these products are, in the "Most realistic case", estimated to reach 7,9 mill USD during 1989, 10,6 mill USD 1993 and 18,9 mill USD 2000.

Cosnequently the market share of APHAS is estimated to be 8 % at the beginning of the period and to reach 10 % at the end of the period.

Planning for continued license acquisitions and/or export marketing is suggested to be done at a later stage for concentration purposes.

Products and licensors are listed in the study.

With the above background a self-contained plant has been outlined and divided into two subprojects:

* Local investment project (ground preparation, roads, warehouse, administration, utiliities etc.)

* Pharmadule modules for pharmaceutical processing

The plant will make three technically different types of pharmaceutical products:

* "Dry" products (tablets, capsules etc.)
* "Wet" products (mixtures, suspensions etc.)
* "Antibiotics" i.e. penicillins (separated for GMP reasons)

The usage of the Pharmadule system for the process buildings and equipment will ensure:

* The selected level of GMP
* Complete and tested process equipment and process utilities
* No cost overruns for this part of the project
* Easy future expansion

The installed capacity will be sufficient for the first 5 years of operation whereafter further capacity investments will be required.

The global investment cost is estimated to 15 mill USD whereof about 7 mill USD are local and 8 mill USD are related to Pharmadule modules.

IV. Materials and inputs

All raw materials and the dominating part of the packaging materials as well will have to be imported, either from the licensor, or from suppliers assigned by them.

Raw materials and packaging materials account for about 32 % of the sales or 2.5 mill USD by 1989 level. It may be noted that the total cost for packaging materials is higher than for the raw materials.

Factory supplies e.g. guards, canteen, laundry, infirmary etc. are included in the costing.

Utilities like water, electricity, waste water treatment, nitrogen and burning gas are provided locally.

V. Location and site

The site for the project is located 60 km from Douala at the road to Limbe at a place called Likombe where an industrial park is planned. There 2,5 ha have been reserved for this project.The site is still unprepared land.

VI. Project engineering

The site is 25000 m2 out of which 12000 m2 will be used for the project and the rest kept for future expansion.

The site is dominated by the main 2-storey building comprising administration and warehouse 6 and 8 meters height respectively. The warehouse has space for 1400 pallets in 4 levels.

Connected to the main building are three modular units for "dry", "wet" and "antibiotic" production.
Each production unit is 160 m2 and the QC laboratory is 120 m2. The utilities needed for the production are placed on top of the modules.

The selection of process equipment at this stage has been done from general considerations and have not been checked with the licensors.

Each production unit will need about 15 people.

Costs for technical assistance is included.

Civil works will be assigned to a local contractor.

VII Plant organization and overhead costs

The organization has been designed as a traditional "functional" organization comprising 6 departments besides the top management:

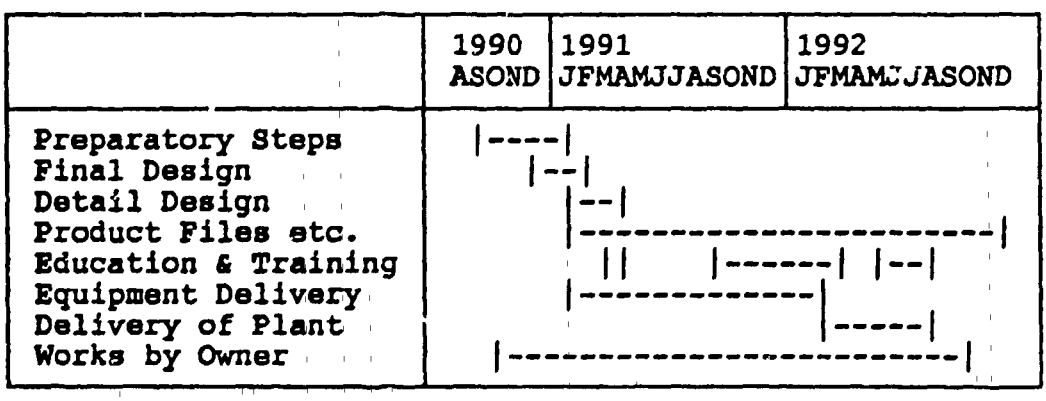
*	General management	3 people
*	Marketing	23 people
*	Production	57 people
*	Materials Administration	16 people
*	Quality Control	12 people
*	Legal and Medical Affairs	7 people
*	Administration	24 people

VIII. Manpower

The project will employ 142 people initially out of which 38 will have university education.Training programmes are outlined for two phases. 15 people are earmarked for initial training programmes at licensor's and/or the technical partner. The remaining staff will undergo in-house training at the end of the project period.

IX. Implementation schedule

A project implementation schedule covering the period August 1990 - December 1992 and including 125 subactivities is designed.In summary it looks as follows:



X. Commercial Profitability

3 different scenarios have been designed in order to illustrate the commercial development of the project:

* Most realistic case
* Most optimistic case
* Most pessimistic case

A summary of the most important indicators from these three scenarios follows:

	Most realistic case	Most pessimistic case	Most optimistic case
Sales 1993 (tUSD) (real terms)	10 000	7 000	10 000
Sales 2000 (tUSD) (real terms)	18 798	13 159	37 739
Int.rate of return % (1993-2000)	8 - 33	-6 - 19	8 - 54
Payoff-period (years)	1 - 2	7	1 - 2
Acc.net disc.value at 20 % (mUSD)	6 932	577	11 152
Year of first profit	1993	1997	1993
Current ratio	2,8-21,0	-0,1-6,1	3,1-41.3
Quick ratio	0,6-17,3	-2,2-3,4	0,6-33,8

All scenarios have an acceptable pay-off period, in fact two have extremely short pay-off periods and profitablity and a positive accumulated net cash discount value although the value of the "Most pessimistic case" is close to zero. The internal rates of return are at acceptable levels after the first years with the exception of the "Most pessimistic case". Liquidity is a problem thorughout the period for the "Most pessimistic case" where additional where additional medium/long term borrowing is needed matched by an increase in equity. For the two other cases additional short-term borrowing is needed during 1993 matched by collaterals and/or equity.

Detailed income statements, balance sheets and cash flow projections are presented for each case.

A comprehensive note apparatus is included in the main text.

Tables, outlining the assumptions and calculations of the financing setup, are found in Enclosure 22 which is also enclosed to this summary. The project is assumed to be financed by 35 % equity and 65 % borrowings.

The loans will be 2,3 mill USD as medium-term and 7,4 mill USD as long-term. No short-term borrowings are foreseen for the "Most realistic case" .

The three scenarios are illustrating the sensitivity of the project but to illustrate the sensitivity in a more practical sense the following sensitivity analysis is made:

Cost element (*)	% change	% profit impact
Relative prices	1	9,7
Sales volume	1	6,5
Other costs	1	3,6
RM+PM	1	3,0
Capital costs	1	2,2

*) Most realistic case.1995

XI. Impact on the national economy

Net savings of foreign currency by the project is estimated to 57 mill USD during the 10 first years.

Local resources will be used for equity formation, part of the lending, land, site preparation and civil works, local utilities, management staff and labour.

142 people will be employed by the company in the beginning with a probable increase to 186 people by the end of the period.

Modern technology in the pharmaceutical field will be transferred to Cameroon.

The negative environmental impact of the project is limited or negligible.

The value-added of the project is calculated to 67,3 mUSD during the 10-year period.

XII. Risk factors

The key risk factors for the succes of the project are:

* Suppliers/Licensors contracts
* The development of the pharmaceutical market in Cameroon
* The risk of devaluation of the FCFA

They will need special attention and action to be reduced or controlled.

NORMATIVE CONCLUSIONS- the Consultant's point of view:

Is the APHAS pharmaceutical industrial project in Cameroon a feasible project ?

There are five different questions related to the feasibility that have to be answered:

1. Is there a market for the products to be manufactured and marketed by APHAS ?

2. Is the project possible to implement from a technical point of view ?

3. Is the economy of the project satisfactory ?

4. Is it possible to finance the project ?

5. Are there circumstances or factors that may drastically change the prospects of the project and which may offset positive answers on the first four questions ?

Is there a market for the products to be manufactured and marketed by APHAS ?

The three most important health problems in Cameroon are infectious diseases, malaria and parasitic infestations. The business strategy of APHAS is to become a market leader in the treatment of these diseases in Cameroon and later on in the UDEAC countries.

To reach this position APHAS intends to license manufacture high-quality ethical products from a group of original manufactures.

It is estimated that these diseases will continue to be the main health problems in Cameroon for many years to come.

The market for these products already exists in Cameroon but the market still offers a considerable growth potential, in relation to the need if not to the economic possibilities, although the per-capita consumption of pharmaceuticals in Cameroon is quite high for African standards.

The per - capita consumption in Cameroon is estimated to 15 - 20 USD at consumer level whereas the level in Western Europe (at about the same price level of products) reaches an average of 150 USD. With a real growth rate of 10 % p.a. it will take the consumption in Cameroon 20-25 years to reach the European level.

For a couple of years the market of pharmaceuticals have slumped, after a number of years of record growth, due to the economic crisis in the area.

There are reasons to believe that the pharma market will recover and that a growth of 6 - 10 % p.a. can be expected for APHAS.

Conclusion:

There is a substantial market for the selected product categories which will not be satisfied for a long time ahead. So from a market and marketing point of view we consider the APHAS project feasible.

Is the project possible to implement from a technical point of view ?

C.F.I, the main promotor of the APHAS project, offers an industrial environment with experience in manufacturing and marketing of a variety of consumer and industrial goods and commodities.

The technical partner of C.F.I, Pharmadule AB, will supply the sensitive processing parts of the plant in forms of pre-fabricated modules with guaranteed compliance to international GMP-rules.

C.F.I:s experienced construction company will make all local design and construction works.

Suitable management, staff and labour is available in the country or can be brought from France. Technical assistance and training will be provided.

C.F.I. has experience from successful implementation of similar projects before in Cameroon and Pharmadule and the Consultants have experience from the pharmaceutical industry in developing countries and there is therefore no reason to believe that this project cannot be technically implemented successfully.

We therefore consider the project technically feasible.

Is the economy of the project satisfactory ?

We have studied three different possible scenarios of the project which are summarized under "Summary of the study", Chapter X " Commercial profitablity".

We draw the conclusion that two of the scenarios are quite profitable with a questionmark for the third and "Most pessimistic case". For this one there is also a liquidity problem which will require additional short-term borrowing.

It should be noted however that the rather extreme liquidity of the two "best" scenarios have to do with two factors:

- No company tax is payed during the period

* We have not anticipated any dividends either during that period lacking input from the Promoters.

Since the profits are tied up as cash, without any interest, they also affect negatively of course the turnover rate of capital.

Since the above scenarios are variations on the same theme one can also see that the APHAS project has quite a buffer towards changes in the market situation.

We consider therefore the APHAS project to be an economically feasible project.

Is it possible to finance the project ?

With the above profitability figures we think that there should be no problems in raising the equity from sources inside and outside Cameroon.

The mechanisms of financing have been outlined already in the previous APHAS study and they have been updated in this study.

Apart from C.F.I participation in equity other Cameroonian several other local private investors will contribute.

We highly recommend that the pharmacists are invited as well as the medical profession.

Swedfund and similar investment organizations in Europe and IFC has expressed interest to enter into the project.

As for commercial financing of the long/medium term loans C.F.I. is sure that this part will also be solved.

With the merits of the project itself and the contacts and relations with various financing institutions that C.F.I. already has we consider that the project is financially feasible. Furthermore Swedfund has agreed to design and coordinate a financial setup.

Are there circumstances or risk factors that may drastically change the prospects of the project and which may offset positive answers on the first four questions ?

There are three factors which are decisive for the success of the project:

* The successful license negotiations

* The development of the market in Cameroon

* The possible devaluation of the FCFA as a result of "untying" the dependency on the French Franc.

APHAS cannot do very much about the development of the market in Cameroon but it can do something while waiting for the tide to turn:

It can apply aggressive and professional marketing and it can act to turn the fragmented structure to its advantage.

As for the license negotiations APHAS can certainly do several things. The first thing is to decide the license strategies and the next thing is to allocate time and resources to plan to start and to conduct the negotiations. They should be started immediately.

As for the devaluation risk it is certainly a reality and a substantial devaluation may be devastating to the project (and to the Central African economies generally). Knowing about the risk makes it possible to offset or at least to plan to offset the risk.

Conclusion:

We have analyzed the APHAS project from various points of view ; demand and market, technical, economical and financial.

Our conclusion is that the project is feasbile also taking into account the risk factors of the project.

We therefore recommend the project to be implemented.

Chapter II

Project background and history

II.1 Description of the project concept and identifying the major parameters affecting the study

II.2 Outlining economic, financial and social policies

II.3 Identifying the project promoter

II.4 Outlining the historic development of the project identifying the author and ordering party for the feasibility study

II.5 Estimating the cost of all studies including any further studies recommended that are part of project pre-production expenses

II.1 Description of the project concept and identifying the major parameters affecting the study

The "APHAS" project is the working name on the pharmaceutical industrial project in Cameroon with which this feasibility study is dealing.

The project concept, as it has been presented to us, is as follows:

"license-manufacturing and marketing in Cameroon of high-quality pharmaceutical specialities from well-known international pharmaceutical companies and in a technical environment which is complying with international standards of GMP".

We have elaborated and refined this project concept into a set of business development strategies for guidance.

These strategies will be discussed in detail below.

The general priorities of the project are:

1.Profitability

2.Quality

3.Investment cost

4.Time

Apart from these general parameters which have been taken into account as guidelines for the study we have added one more important parameter after having studied the previous material:

CONCENTRATION

i.e.

Concentration on licensors
Concentration on indications
Concentration on dosage forms and technical processes
Concentration on geographical markets

The rationale behind this is our experience from establishing pharmaceutical industries in other countries that the more complex the mixture the greater the risk for failure or at least suspended growth (and thereby profitability)

The concept of CONCENTRATION has also been used in the "UNIDO study" (Ref.1) then mainly referring to sales value. We have taken this at a staring point and extended the concept to include the above elements also.

II.2 Outlining economic,financial and social policies

The main policies of the "APHAS"-project are described as follows:

* The product-profile to be geared at major health problems of Cameroon and Central Africa

* License-manufacturing of high-quality brand-name pharmaceutical specialities from reputed international companies

* Compliance with international standards of Good Manufacturing Practice

* Building alliances with existing structures and health professions

* Private enterprise

* Prioritize profitability,quality,investment cost and time in this order

II.3 Identifying the project promoter

The main project promoter is C.F.I or Compagnie Financière et Industriélle, Douala, Cameroon which is a fairly recently established holding-company to which the holdings of a number of Cameroonian private investors have been transferred.C.F.I controls a rather large number of companies in a variety of businesses e.g.:

cigarettes
cocoa and coffee
refrigeration and air-conditioners
construction

C.F.I is active in the development of further businesses such as pharmaceutical industry, printing etc.

UNIDO has during the preparation time for the APHAS project been co-promotor to C.F.I and assisted i.a in the search for a technical partner and a financing partner. The C.F.I and UNIDO have joined forces with Swedfund, a Swedish foundation for industrial cooperation with developing countries and with Pharmadule, a Swedish company specialized in turn-key pharmaceutical plants.

For the purpose of the feasibility study these four organizations have formed a Consortium with a vision to be partners in APHAS later on.Other partners, cameroonian and international, may at that stage be invited to participate as shareholders.

II.4 Outlining the historic development of the project identifying the author and ordering party for the feasibility study

The ordering party for the feasibility study is a special trust fund set up under the auspices of UNIDO.The money to this trust fund has been provided by C.F.I., Pharmadule and Swedfund.

The author of the study is SweDrug Consulting AB an international consulting company based in Sweden and specialized in pharmaceutical business development, management and transfer of technology.

SweDrug Consulting has 12 years experience from a variety of pharmaceutical projects in more than 20 countries.

Main authors of the feasbility study are the President of SweDrug Consulting mr Staffan Sjölin M.Sc.(Pharm.), M.B.A. and mr Lars Turstam Civ.eng. and Project Manager at Pharmadule.

II.5 Estimating the cost of all studies including any further studies recommended that are part of project pre-production expenses

We have not been provided with historic information about costs for previous studies.

One of the basic ideas with this feasibility study is that it should provide a firm,focused and complete decision basis for the "APHAS" project for the parties concerned and thus no further studies are anticipated nor recommended.

As far as the project engineering is concerned it is part of the turn-key contract and not a separate "study".

There will however be other pre-production expenses but they cannot be characterized as "studies".They are outlined in Chapter X.

Chapter III

Market and plant capacity

III.1 Description of the proposed products with justification of the selection made

III.2 Demand and market

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III.2.3 Market structure and segmentation,numbers and types of sellers and buyers,competitive patterns and distribution channels for each segment

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III.4.1 Realistic time schedule for achieving exportable quality,prices,contribution margins,marketing costs and reliability of supplies

III.4.2 Analysis of neighboring regional markets for the products-past,present and trends

III.4.3 Proposed marketing strategies,organization and costs

III.4.4 Projections for major export markets under consideration

III.4.5 Projected export volumes,prices,revenues and contributions for the proposed project, reflecting its export strategies,capacities and channels.

III.5 Production programme

III.5.1 Description of the production programme and its changes through the life of the project. Consideration should be given to such factors as

- plant capacity
- production
- shipping
- import
- advantages of various sizes and qualities of products
- start-up and learning curves
- operational efficiency (and storage requirements)

III.5.2 Detailed tabulations identifying type and size of products,giving weight of products/year,hours etc for each major production unit.

III.5.3 Estimation of the generation of "second" grades, rejects, and wastes,effluents and emissions for treatment or difsposal (if any).

III.5.4 Estimates of costs of treatment or disposal of wastes,effluents and emissions (if any)

III.6 Plant capacity

III.6.1 Identification of the parameters to be used in determining the plant capacity

III.6.2 Selection of plant capacity from two or more alternatives,giving reasons for the choice and identifying both nominal and normal feasible capacities.The capacities should be identified both for the complete plant and for each major production unit (tablets,solutions etc.)

III.6.3 Estimation of the eventual excess capacities

III.1 Description of the proposed products with justification of the selection made

Before going into the exact selection of the products here we will describe a little the work that has been done already in this context.

In the feasibility study from 1987 APHAS suggested a rather large number of products selected from the large-selling items on the Cameroonian market.This method of selection is quite logical but has its draw-backs.

An"Aid-Memoire" 29 March 1988 by Dr János Pogány of UNIDO concludes:

"The basic production strategy of manufacturing brand name - drugs, well etsablished by TNCs on the Cameroonian market, is the best option. The major risk of this approach is that originators might refuse to grant license on poliycy, business or technical grounds".

We are completely behind this basic idea and we have applied it throughout this study. The alternative is to build up a company based on generic products.

This concept has several disadvantages as compared with the "brand-name" alternative:

* It means building up a market position from scratch, since there is virtually no "market" even if there might be a "demand" for generic products.

* There is no sizeable public health demand for generic products

* Profits would be considerably lower

This preliminary product list has then been analyzed further in the techno-economical study made by UNIDO.Also this list has however been based on the concept of large sales.

When we analyzed the "UNIDO list" (Ref.1) we found a some inconsistencies which made us draw the conclusion that a precise an consistent business strategy had to be worked out. We will comment these here:

1.Some generic products have been outlined as alternatives to the licensed specialities in case, as we have understood, that the license negotiations would not be successsful.

We would not support this for two reasons:

* manufacturing license specialities and generics are two different business concepts as we see it which require two different behaviours in the company and in

the market and which are very difficult to combine.They also imply different cost structures etc.

* to have a generic line along with licensed specialities will give rise to negative reactions on part of the licensors and will therefore not create the right type of business atmosphere with them.

We therefore recommend that this idea is dropped.

The sales of future generic products have been included in the total sales.It should rather have been either or.

2.Then there are competitive situations also between some of the license products:

* we don't think that it will be possible to sell e.g. Aspro and Aspegic simultaneously.Firstly because we don't think that the licensors will accept it and secondly because it will create confusion in the marketplace and in the company.

* we don't think that Bristol-Myers will accept that APHAS manufactures e.g. antibiotics from Pfizer and vice versa.

* in the case of anti-malarials the case is perhaps a little more difficult but there might be a competitive situation with regard to e.g. Resochine,Quinimax and Fansidar even if they are not direct substitutes.

As a conclusion from these observations we have tried to develop a business business strategy without these ambiguities:

Tentative business strategies of APHAS, order of priority:

SUMMARY

Main strategy:

"Market penetration of the home market with high-quality prescription pharmaceuticals under license and alrady present of the Cameroonian market, in alliance with the health professions and used in the tratment of major health problems in Cameroon i.e.infections, malaria and parasitical infestations".

(from Minutes of Meeting between financing partners Douala, Cameroun 1990-10-05)

Step 1 = S1 Establishment and penetration of home market

Step 2 = S2 Market leadership on selected segments of home market

To yield a growth rate in real terms of 6-10 % p.a. through better and more qualified promotion.

To yield, after the inital 2-3 years of establishment, an additional growth of 4-6 %, by taking market share from the competition.

Secondary strategies:

* International marketing to UDEAC countries (S3)

In the "Most optimistic" scenario (see Chapter X) we have estimated a fairly rapid growth in the export market starting of 1994 with 10 % of the volume of the Cameroonian market, 1995 with 20 %, 1996 with 40 %, 1997 with 80 % and 1998-2000 with 100 %.

* To extend the range of products with other licensed products (S4)

synergistic to S1 or S2 above or

high-quality ethical pharmaceuticals which are geared towards important medical conditions in Cameroon or which may otherwise contribute to a more rational use of the resources of the company e.g. manufacturing of health cosmetics or parapharmaceuticals and disinfectants.

* To develop own products and brand names

* To initiate negotiations through Pharmadule to represent major Swedish pharmaceutical industries in Cameroon and in the UDEAC countries

(For a quantitative presentation of the strategies please see Enclosure 1)

These tentative strategies have been discussed with the promotors several times and we are of the opinion that it reflects quite well the business concept of the APHAS project at this stage of development.

We are sure however that it needs further refinement and elaboration and perhaps also reorientation as knowledge develops and as threats or opportunities arise.

With the help of these strategies we can now proceed with the product selection, although with these strategies, the first choice will be the prospective LICENSORS.

After the selection of the licensors we will select their specialities in the main indications we have chosen to be our core business.

Then we will select other products from these licensors which may then fulfill the Strategy No 3

The result of this selection procedure is then as follows:

Potential licensors and their products registered in Sweden:

(OBS.We have used the products registered in Sweden because we have data readily accessible.One has to be a little careful however because the companies may have products sold internationally which are not registered in Sweden. We think it is wise if APHAS listens to what the companies themselves suggest).

When we have excluded certain products this does not mean that we have anything against these products per se, only that they do not fit the selected business strategy as it has been formulated.We have however chosen to list these products all the same to illustrate the consequences of the product selection.

This also supports the general idea of CONCENTRATION

S1+S2+S3	Products selected in line with growth strategies 1, 2 and 3 resp.
S4	Products to be considered in line with strategy 4
NO-license time Products	Products NOT to be licensed,for the being,because falling outside S1+S2+S3 and S4

BAYER

S1+S2+S3 Products	Resochin	Antimalaria	Chloroquine	TUC
S4 Products	Dolviran	Analgesic		TUC
	Baypen	Penicillin	Mezlocillin	ISO
	Canesten	Antimycoticum	Clotrimazol	CRE
	Mycosporan	Antimycoticum	Bifonazol	CRE
	Yomesan	Bandworm	Niclosamid	TUC
NO-License Products	Adalat	Ca-flow-inhibitor	Nifedipin	CAP TUC
	Alreumat	Antiflogisticum	Katoprofen	CAP
	Aspirin	Analgesic	A-acid	TUC
	Baycaron	Antihypertonic	Mefrusid	TUC
	Trasylol	Antifibrinolytic	Aprotinin	ISO

BOUCHARA:

S1+S2+S3	No products in this area		
S4	Neo-Codione/cough prep	various	SOR
NO-License Products	Not listed here		

BRISTOL-MYERS

S1+S2+S3 Products	Pentrexyl/Antibiotic	ampicillin	CAP PFR ISO
S4	Biklin B-S-antibiotic	amikacin	ISO
	Bristamox/Penicillin	amoxicillin	CAP
	Cefamox antibiotic	cefadroxil	CAP
	Diclocil Penicillin	dicloxacillin	CAP PFR ISO
	Kamycine antibiotic	kanamycine	ISO
NO-License Products	Amsakrin Cytostatic	amsakrin	ISO
	Becenun Cytostatic	carmustin	ISO
	Mutamycin/Cytostatic	mitomycin	ISO
	Paraplatin/Cytostatic	carboplatin	ISO PFR ISO
	Platinol Cytostatic	cisplatin	ISO
	Questran Anionexhanger	colestyramin	PFR
	Sotacor Antihypertonic	sotalol	TUC
	Vepesid Cytostatic	etoposid	ISO
	Vumon Cytostatic	teniposid	ISO

CIBA-GEIGY

S1+S2+S3	No products in this area		
S4	Voltaren Analg/flog		
	Locacorten/medium gluko Tar corticoid	flumethason	CRE
	Vioform		
	Rimactan Tuberculostatic	rifampicin	CAP SOR CAP
NO-License Products	Not listed here		

HOECHST

S1+S2+S3	No products in this area		
S4	Hemostyl substitute	iron	SOR
NO-License products	Not listed here		

INNOTECH

S1+S2+S3	No products in this area		
S4	Terpone Expectorans	terpin hydrate	SOR
	Tothema substitution	B12+liver	SUO
NO-License Products	Not listed here		

JANSSEN

S1+S2+S3 Products	Vermox	Anthelminticum	Mebendazol	TUC SOR
S4 Products	Daktacort/Antimyk+glukocort		Miconazol/hydrok	CRE
	Daktar	Antimycoticum	Miconazol/gyn	CRE
	Fungoral	Antimycoticum	Ketoconazol	CRE
	Imodium	Antidiarroikum	Loperamid	TUC SOR
NO-License Products	Dridol	Neurolepticum	Droperidol	ISO
	Glanil	Antihist	Cinnarizin	TUC
	Haldol	Neurolepticum	Haloperidol	
	Lealgin	Analgesic	Phenoperidin	ISO
	Leptanal	Analgesic	Fentanyl	ISO
	Orap	Neuroleptic	Pimozid	TUC
	Piridolan/Analgesic		Piritramid	ISO

NICHOLAS

S1+S2+S3	No products in this area (Palaprin !)			
S4	Aspro	Analgesic	A-acid	TUC
NO-License Products	Not listed here			

PFIZER

S1+S2+S3 Products	Combantrin	antiparasitic	pyrantel pamoate	
	Vibramycin/B-S	antibiotic	doxycyklin	TUC
	Vibramycin N			SOR
	TAO	antibiotic	trioleandromycin	
S4	Fasigyn	Anti-trichomonas/ Antiamoebic	Tinidazol	TUC
	Ficortril	Glukocorticoid	Hydrocortisone	CRE
	Terracortril/mild glukocort. +antibiotic		oxitetracycline	CRE
NO-License Products	Daricol	Anticholinergic	Oxyphencyclimin	TUC
	Diabines	Antidiabetic	Clorpropamid	TUC
	Felden	Antiflogistic	Proxicam	TUC SUP
	Glibenese/Antidiabeticum		glipizid	TUC
	Peripres	/Anti-hypertonic	Prazosin	TUC
	Renese	Diuretic	Polythiazid	TUC

ROCHE

S1+S2+S3	Bactrim	antibacterial	trimethoprim+	TUC
	Bactrim forte		sulfamethoxazol	SUO ISO
	Bactrim forte			
	Fansidar/antimalaria		sulfadoxin/ pyrimethamin	TUC

S4	Ancotil	Antimycotic	flucytosin	ISO
	Fluoro-Uracil	Chemotherap.	fluorouracil	CRE
NO-License Products	Alloferin/muscle relax		alcuronium	ISO
	Arfonad	/antihypertensive	trimetharphan	ISO
	Arovit	vitamin A	retinol	TUC
				SUO
	Becozym	B-kombinate		TUC
	Benadon	B6	pyridoxin	ISO
				TUC
	Benerva	B1	thiamin	TUC
	Bephanten		dexpantheol	CRE
				TUC
	Calcevita/C,D,B6			EFF
	Dermairol/ACNE		tretinoin	CRE
	Dormicum/sedative		midazolam	ISO
	Ephynal/vit E			TUC
	Iktorivil/antiepileptic		clonazepam	ISO
	Konakion/K1		phytomenadione	TUC
				ISO
				SUO
	Larodopa/antiparkinson		levodopa	TUC
	Librax	spasmolyt+psychod	chlorodiazepoxid +clidin	TUC
	Librium/anxiolytic		cholorodiazepoxid	TUC
				ISO
	Litrison	B-komplex		TUC
	Madopark	anti-parkinson	levodopa + benzerazid	TUC
	Mestinon	myastenia gravis	pyridostigmin	TUC
	Mogadon	hypnotic	nitrazepam	TUC
	Natulanar/cytostatic		procarbazin	CAP
	Nipride/vasodilatans+ anti-hypertensive		nitropussid	ISO
	Noludar	hypnotic	methyprylon	TUC
	Persedon	hypnotic	pyrithylidon	TUC
	Protovit	polyvitamin		SOR
	Rocaltrol/Vit.d2		calcitrol	CAP
	Rohypnol	hypnotic	flunitrazepam	TUC
	Ronicol retard	vasodil	3-hydroximethyl pyridin	TUC
	Tigason	anti-psoriatic	etretinat	CAP
	Topostasin/trombin			ISO
	TRH	thyreotropin releasing hormone		ISO
	Valium	anxiolytic	diazepam	TUC
	Valium N			

SANOFI/LABAZ

S1+S2+S3	Quinimax	antimalaria	quinine comb	TUC
				ISO
S4	No products listed here			
NO-License Products	No products listed here			

SYNTHELABO

S1+S2+S3	No products in this area		
S4	Aspegic analgesic	Aspirin-lysinate	PIS
NO-License Products	Not listed here		

UNICET

S1+S2+S3	No products in this area		
S4	Gentalline/antibiotic	Gentamycine	ISO EOI EDR
NO-License Products	Not listed here		

It should be noted that the products selected are also the largest selling items in the market. They are selected from the "Top-10"-product list of Ref.1.

Summary:

Following the above presentation we have made a selection of products in accordance with the following criteria:

* Sales value
* Consistency with the strategies
* Technology/Production volume
* Additional investment costs (if any) for inclusion of the product

The resulting product list is:

Aspro
Bactrim
Combantrin
Dolviran
Fansidar
Gentalline
Kamycine
Quinimax
Resochine
Terpone
Totapen
Trobicin
Vermox

The study is based on the selection of these products their respective sales and growth, prices, cost structure technological requirements and organization support.

The starting point of of the 10-year sales projections and other calculations is the 1986/87 value regarding landed costs

and raw material costs as defined and presented in the "UNIDO Study" (Ref.1). We have assumed that the same values are valid for our basic year 1989.

All prices and costs and other values are related to 1989.

Suggestions for a negotiating strategy in relation to licensors:

1. Those licensors which have products in the priority areas S1+S2+S3 are the ones to be approached first.They are:

   Bayer
   Bristol-Myers
   Janssen
   Pfizer
   Roche
   Sanofi/Kabaz

2. When licenses satisfying the S1+S2+S3 strategies have been acquired possible S3 products should also be negotiated

   For suggestions see above list.

3. Should the combined efforts of 1 and 2 not be satisfactory in relation to e.g capacity utilization then we suggest that the other manufacturers are approached:

   Bouchara
   CIBA-Geigy
   Hoechst
   Innotech
   Nicholas
   Synthelabo
   Unicet

4. It could be anticipated that Roche will propose that their vitamine line should be picked up and they might even put it as a condition.The other Roche products we think should wait and there are good arguments for that.(Strategy selection + necessity to concentrate + market size)

   As for vitamines we think that the products should not be brought up by APHAS in the beginning.If Roche brings the matter up the the company strategy should be explained once again and, if they insist, APHAS might give in and market a selection.

III.2.1 Domestic.Analysis of past and present markets

The availability of statistics generally in Cameroon is limited both in quality and quantity. Unfortunately it has not been possible to get much updated market information, meaning that we for the purpose of this study still have only one point of estimate combined

with global market data. This makes it not possible to extract quantitative trends of market segments or individual products.

There exists a trade statistic in France covering pharmaceutical exports in the region and published by "GERS".

These statistics which are statistics over exports from France are only available to companies which are manufacturing companies and which contribute information to the statistics. In spite of several attempts in has not been possible to acquire these statistics, officially or unofficially.

We would recommend APHAS to organize itself as soon as possible to collect and evaluate market information systematically and periodically. This is particularly crucial in a turbulent market situation.

So what we have at present is an information situation where we are largely referred to "well informed guesstimates" as basis for sales and volume assumptions. This is however often the situation in developing countries and does not necessarily imply poor decisions.

You can found an industrial enterprise larger than APHAS based on "well informed guesstimates" but it cannot survive in the long rund without more solid market information.

The historic development of the Cameroonian market as it manifests itself in the available statistic is as follows: (millions CFFA)

	Public sector*	Private sector	Total	Annual change %	3 year chain index	GDP change %
81/82	1.400	19.000	20.400	-		
				12.7		-
82/83	2.000	21.000	23.000		100	
				26.0		7.6
83/84	4.000	25.000	29.000		114	
				4.3		10.3
84/85	2.250	28.000	30.250		129	
				13.3		3.8
85/86	2.290	32.000	34.290		141	
				8.8		-4.2
86/87	2.300	35.000	37.300		144	
				-12.6		-7.9
87/88	2.000	30.600	32.600		136	
				-12.3		-19.5
88/89	1.900	26.700	28.600	-		

* includes aid from international organizations

Both the pharma market and the GDP are here measured in current prices.

These series are not easy to interpret or to use as background for a prognosis of how the market will develop in the future.

Its seems that there is a relationship between the development of GDP and the development of the pharma market.It seems that a change in the GDP induces a similar change in the pharma market the year after. The problem is however that this cannot be used for prognosis purposes since the figures of GDP will probably be avaiable after the figures from the pharma market.

It is not easy to draw any conlcusions from the above series and there does not seem to any direct relationship between the changes in the general economic conditions and the development of the pharma market.

The chain index indicates an annual growth over the studied period of 6 % p.a. in current prices in fact then a stagnation over the period. This period starts however off with a rather strong growth followed by a regression in the last couple of years.

Again a difficult prognosis situation.

We can see that the pharma market in times of good economic development is capable of growing by 10-12 % p.a. in real terms and even more.This is what could be expected in a developing country with reasonable economic growth and resources.

That growth figure can be compared with the market growth in most European countries which vary between 0 - 2 % p.a. There is reason to believe that when the economic development turns around the pharma market should start to grow again with 5 - 10 % in real terms.

We can see that the latest year from which we have figures indicates a "stabilization" in the negative growth of the pharma market. This could indicate that the bottom has been reached.

In fact this assumption is supported by e.g. the "Economist" :

"... but modest real growth is expected in 1990 ".

We had hoped to get detailed information about the development of the products in question at least during the last year in order to have at least one more point of reference but it has not possible to get hold of yet.

III.2.2 Domestic supplies and imports,volumes and values for each product

Here we are again suffering from the lack of information so we have to revert to generalities.

Still more than 90 % of the consumption of pharmaceutical products are imported ready - made from France, either from French companies or from non-french MNC:s established in France.
There is very little local production in Cameroon and the big exception is of course Rhône-Poulenc Santé.There are a small number of other pharmaceutical manufacturers but their impact on the market is insignificant:

Plantecam (govt. owned manufacturer of IV-solutions)
SIPP
Laboratoires LDN
Alphas S.A
Sipharcam

This information reached us rather late so we have not been able to investigate details about these companies.

The private market stands for the majority of the consumption of pharmaceutical products whereas the consumption of the public health sector varies between 6 - 14 % of the total. The public health care is furnished almost totally with grants from international organizations like USAID, UNICEF etc. The local wholesalers do not supply the public hospitals for the simple reason that the hospitals do not pay the bills.

III.2.3 Market structure and segmentation,numbers and types of sellers and buyers,competitive patterns and distribution channels for each segment

There are around 400 different companies present on the Cameroonian market with around 4000 pharmaceutical specialities and with a global sales of around 820 mill FF at manufacturer level.

Although the per capita comsumption of pharmaceuticals is comparatively high 15 - 20 USD per capita and year (at consumer level) it is apparent from the above figures that the market is rather fragmented.

More than 90 % av the products are imported from France, either French companies or Transnational companies based in France.

In recent years smuggling from neighboring countries seems to have taken quite a size although there are no estimates available as to how sizeable this smuggling

is.The products are sold more or less openly in the streets and obvioulsy little risk of sanctions from the authorities.These products are originating mainly from Nigeria.

With the exception of the smuggled products the pharmaceuticals are distributed through the 6-7 available wholesalers.The wholesaler's are dominated by Laborex which covers 80 % of the market.

The main market segments are the ones derived from the morbidity pattern of the country i.e.

Infections
Malaria
Parasitical infestations
Skin diseases

For the time being and probably for a long time ahead "industrial society" health problems like hypertension, gastritis etc.like are not important elements of drug usage.

The statistics of morbidity does not seem to be particulary accurate so it is not advisable to derive e.g. potential sales of products from these figures.

The relative importance of the main indications have been confirmed by several sources however.

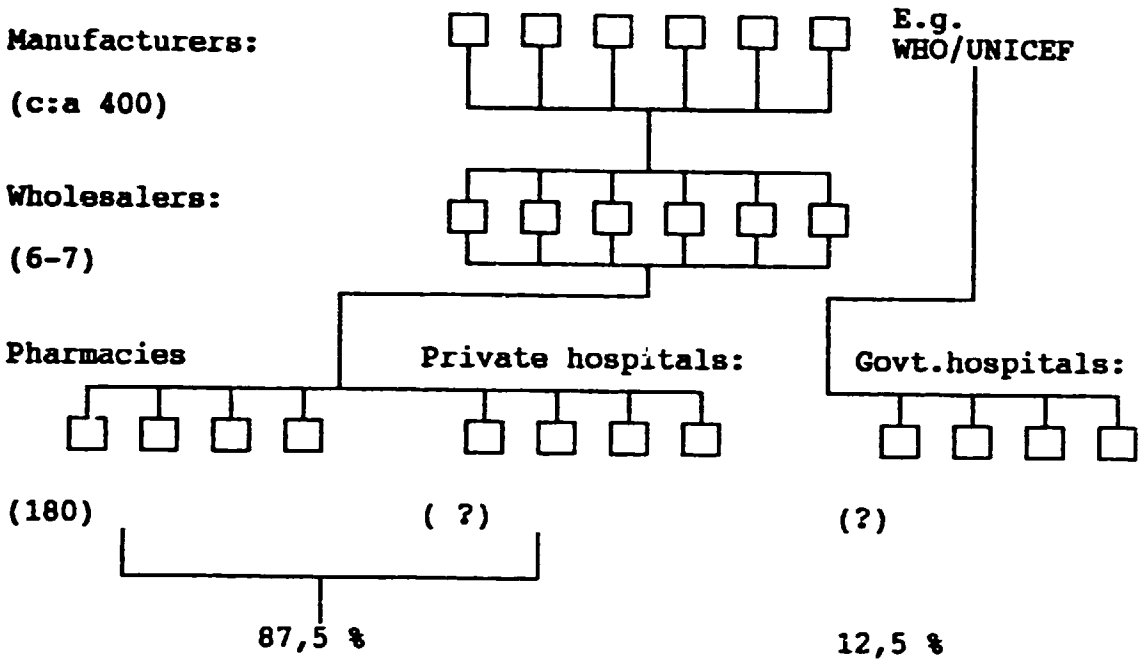
There are around 130 pharmacies in Cameroon which retail pharmaceuticals.They seem to be well kept and organized and with good professional status.

The pharmacies sell products to the public only.

The private hospitals buy their pharmaceuticals directly from the wholesalers, whereas the government hospitals seem to rely on gifts only, because of lack of financial means.

For the private hospitals the drug bill seems to be 30 - 50 % of the total budget.

The drug market structure in Cameroon:



6 "local" pharmaceutical companies can be identified:

There are at present 5 major wholesalers ((since the APHAS report 1987, GPC has been folded.)

Laborex — c:a 80 % of the market

Socapharm
Ad Lucem
Onapharm
Pharmacam
— c:a 20 % of the market

The wolesalesrs do not have exlusive distributorship agreements with manufacturers i.e. all wholesalers distribute products from all manufacturers, in principle. In principle because the smaller wholesalers cannot, for economical reasons, store items to the same extent as the larger can.

Socapharm which is owned by Rhône-Poulenc distributes also other manufacturers products and Rhône-Poulenc also distributes its products thorugh the other wholesalers.

This means e.g. that CFI/APHAS can chose its own distribution strategy.

It seems that Rhône-Poluenc is trying to push down the wholesaler markups generally maybe in an attempt to monopolize the wholesale market for their products ; "one-channel distribution"

The wholesalers offer more or less the same kind of service to the pharmacies:

Deliveries 1-2 daily
Service levels varying between 60 - 80 % at present.
Margins of 25 % of the price to the public.
Invoicing twice monthly
30 days credit period

Laborex dominates totally the wholesale market, Pharmacam a relative newcomer has been expanding rapidly during the last years by taking market share from the others. GPC has folded.

This indicates movements in the wholesale structure and it is generally believed in the trade that only 2-3 wholesalers will survive the economic crisis.

All of them have suffered from the regression of the market but since we have been refused to get annual reports from the ones interviewed we don't have details.

The 178 pharmacies are distributed geographically as follows:

	No	%	1000's inhab.	%
Adamououa	3	2	520	5
Centre	49	28	1.755	17
Est	4	2	546	5
Extreme-Nord	5	3	1.992	20
Littoral	60	33	1.431	14
Nord	4	2	882	9
Nord-Ouest	8	4	311	3
Ouest	21	12	1.409	14
Sud	11	6	399	4
Sud-Ouest	13	7	891	9
	178	99	10.136	100

80 % of the pharmacies (and probably also the sales) are located in

Littoral
Centre
Ouest
Sud-Ouest

whereas 80 % of the population is located in

Extreme-Nord
Centre
Littoral
Ouest
Nord
Sud-Ouest

This regional picture indicates that APHAS should concentrate on the regions with a relatively high density of pharmacies in the short to medium range with a potential to be exploited in the regions with a low density of pharmacies.

III.2.4 Market and demand determinants;economic,financial and target consumer groups

The Cameroonian consumption of pharmaceuticals is for African standards quite high 15-20 USD per capita as compared to 2-3 USD per capita in the poorer regions.

The growth of the market has for a number of years been around 10-12 % in real terms which can be expected in a developing country with reasonable economic growth and resources.

The drug markets are usually relatively inert to changes in the general economic conditions of a country but it cannot be expected that if the negative growth continues the drug market will remain unaffected, in fact it is not.There seems to be a rather substantial "cushion" however.

We have got several indications however that in Cameroon people tend to go directly to the pharmacies and skip the visit to the doctors when they have a budget problem.

So,the general economic development of the country is an important determinant of the present and future growth of the drug market although the relationship is not simple and easy to predict.

The other determinant is the absence of a public health insurance system implying that all costs of health care including the cost of pharmaceuticals have to be paid directly out of the pocket of the patient.There are no signs that this will change in the forseeable future and this will not boost the growth of the market.

III.2.5 Trade and import regulations affecting market structure

There are no tariff barriers on either pharmaceutical raw materials or finished products.

Up to now there exists another type of restriction protecting local industries: If a product type is manufactured locally its import will be banned.

In line with the "structural adjustment" it is quite certain that this regulation will be dropped with a more liberalized trade policy.The regulation has however not yet been banned and the actual status is not clear.According to our information Rhone-Poulenc tried to use this regulation to create a monopoly for some of their products in connection with their negotiations for the "company convention" but without success.

The registration of pharmaceuticals in Cameroon is as in most countries a "non-tariff trade barrier" although it does not seem to have a very strong impact as yet on the market structure.

In principle it seems that if a product is registered in France it will also be registered in Cameroon.

III.2.6 Major suppliers (producers,importers) and major customers (distributors,consumer groups,industries etc.)Their respective market shares,strengths and weaknesses.

These aspects has been covered in the previous sections of this chapter to the extent that there is information available.

III.3 Market projections

III.3.1 Projections of total domestic market developments based on the above analysis;volumes prices and values

After several years of a negative growth in the pharma market there are signs that a bottom has been reached and that a modest growth can be expected in the next years, however not like the "record years". We have said before that for a developing country with reasonable economic resources a real growth in the pharma market may reach 10-11 % as compared with the 0- 2 % growth of the same market in a developed country.

We assume that in the next 5-yearperiod the pharma market in Cameroon may grow with 6 % p.a. in real terms.

In the last 5-year period of the century that market may gain real momentum again and reach 10 % p.a.

We are lacking background information to make estimates about the price development on the market but according to CFI a yearly price increase of 10 % can be expected in the future.

III.3.2 Proposed domestic marketing strategies, organization and costs

The proposed business strategies are outlined above under III:1.

The marketing strategies are derived from them and are described as follows:

Domination in the fields of treatment of infections, malaria parasites and skin diseases resulting in market leadership.

This shall be accomplished through

* a professional marketing and sales organization with in-house product management and medical competence superior to the competition.

* close cooperation with the medical and pharmaceutical professions in Cameroon

* affecting market structure to APHAS' advantage through carefully planned and executed activities in the company environment.

The organization of and the costs related to the marketing activities are outlined in Chapters VII and X respectively.

III.3.3 Estimated domestic market shares of the proposed project (volumes,values and contributions).

During the first years of operation the market share is expected to reach around 6 % which on this very fragmented market will make APHAS the second company on the market after Rhône-Poulenc Santé.

At the end of the period APHAS is expected to reach a market share of 10 %.

Both figures are calculated in 89/90 prices.

Details of cost structure and contributions are found in Chapter X.

III.4. Exports to be envisaged for the future (as additional alternative).

III.4.1 Realistic time schedule for achieving exportable quality,prices,contribution margins,marketing costs and reliability of supplies

Since APHAS will manufacture under license high-quality and prestigious trademarks once the desired quality is reached for the home market it will also be achieved for the export market.

As we have discussed eleswhere in this report we don't see why APHAS should not be able to reach the quality level stipulated by the original manufacturers.

We have in our calculations estimated the same prices for the export sales as for the domestic sales. We don't have any information indicating otherwise.

For details of prices, costs and marketing costs see Chapter X.

III.4.2 Analysis of neighboring regional markets for the products-past,present and trends

Our reasoning in relation to the export markets is not based on detailed information from these markets. As has been mentioned earlier the emphazis on export sales came rather late during the course of the study and it has not Been possible to collect detailed information about them.

We think however that it can be safely assumed that the export markets show the same characteristics, with practical differences of course, as the domestic market in terms of growth, structure product representation etc.

As for the domestic market however it is of course of outmost importance that APHAS starts to collect systematic market information from these countries.

III.4.3 Proposed marketing strategies,organization and costs

The same market strategies as for the domestic marketing are suggested.

We have not designed a new market organization but the basic organization in Cameroon would have to be supplemented with an international marketing organization including shipping.

We have included the costs for it in the calculations in Chapter X.

We assume that an important element in the export marketing will be a representative organization in each country, initially agents perhaps with own sales rep's and later on maybe APHAS subsidiaries.

III.4.4 Projections for major export markets under consideration

We expect that these markets will grow at about the same pace as the market in Cameroon.

III.4.5 Projected export volumes,prices,revenues and contributions for the proposed project, reflecting its export strategies,capacities and channels.

See Chapter X.

III.5 Production programme

III.5.1 Description of the production programme and its changes through the life of the project. Consideration should be given to such factors as plant capacity production, shipping, import, advantages of various sizes and qualities of products, start-up and learning curves, operational efficiency (and storage requirements).

The products that are given priority according to the earlier formulated company strategies are chosen from the product list presented by UNIDO in 1989 (Ref.1). The production programme as well as the sales programme is based on figures from that report and assuming positive results from the future discussions with the licensors.

Three main production lines are identified based on these facts and assumptions:

1. A "dry" tablet manufacturing unit for uncoated and mainly direct compressed tablets.

2. A "wet" manufacturing unit for injectables in ampoules and for oral solutions and suspensions in vials of different sizes.

3. A "dry" manufacturing unit for antibiotics with equipment and production lines for filling of capsules and for filling of vials/bottles with powder for injection or for oral use.

In addition to these lines and depending on the future product mix technologies for e.g. filmcoated tablets, sachets, ointments and suppositories could also be of interest.

The PHARMADULE CONCEPT is essential for this project and chosen by APHAS and supported by the investors based on both technical and financial advantages as outlined in Encl.24

Flexible and stepwise investment in rationally designed, constructed and built high-technological units that are easily connected to locally built warehouse and administration buildings gives both from financial and technical point of view all the safety regarding costs and project time that is needed for the project implementation and feasibility.

The initial investment in the three production units mentioned above shall at least cover the first five years of operation and the design shall allow easy increase of the capacity by added equipment within the modules or by added modules connected to existing units or as new production lines.

Warehouse, administration, canteen, waste water treatment, changing rooms and work-shop are functions that are built locally and designed for a capacity covering at least the first ten years of operation.

The facilities for manufacturing of antibiotics are kept separate not only as production units but also by dividing the storage area to avoid any risk of contamination with other products.

The produced products are according to the strategies consumed on the domestic market and distributed by whole-salers which should diminish the need of storage areas for finished products.

On the other hand all raw materials and packaging materials have to be imported to qualities and amounts that are very much depending on the demands presented by the licensors. Boxes, lables, inserts are examples on packaging material of interest for future domestic production.

Demands regarding Good Manufacturing Practice in relation to Equipments, Buildings, Organisation, Operation and Documentation are fulfilled within the Pharmadule concept which is endorsed by the World Health Organization and qualified by inspection and certification by drug inspectors from The Swedish Board of Health and Welfare before delivery.

Test-runnings and education before delivery is another option with the Pharmadule concept in order to facilitate and shorten the starting-up and learning periods and give operational efficiency from the beginning.

III.5.2 Detailed tabulations identifying type and size of products, giving weight of products/year, hours etc. for each major production unit.

The enclosed tables (Encl. 2,3,4) show the production situation on the three production lines that are identified and chosen based on the formulated strategy. All figures are extracted from the "UNIDO report" (Ref.1), and the tables for "Sales Programme", "Production Programme" and "Informative Prices of Pharmaceutical Chemicals". Packaging material costs are based on information available in Sweden and reflecting international prices (Encl.6).

The yield figure is 95% for the dry products and 90% for the wet products.

The total summary of Raw material and Packaging material costs from these tables is in Encl. 5 rounded off from 2385.5 to 2,500 USD, covering also the uncertainty regarding some material costs.

III.5.3 Estimation of the generation of second grades, rejects, and wastes, effluents and emissions for treatment or disposal (if any).

The production programme and volumes include estimations about the yield from the different production lines. These yield figures (90% for wet products and 95% for dry products) indicate and cover normal losses depending on the different manufacturing operations and the Quality Control needs but do not include any considerable rejects of not approved products. Nor do they cover any unexpected effluents or raw material losses.

However, we all know that effluents and unexpected rejects now and then occur and the handling of the consequences shall be prepared in advance.
The investment programme includes facilities for waste water treatment, which for sure also can take care of the normal production losses.

From GMP point of view it is a demand that also the waste handling is controlled and recorded especially regarding finished products. Bottles and vials should be emptied or crushed and tablets should for instance be milled before dissolution with water.
All waste of raw material (dry or wet) as well as substances collected on filters can and shall be handled through the biological waste water treatment in a controlled way.

Waste of packaging material like glasses and blisters have to be handled as ordinary garbage outside the company.

APHAS should also investigate how eventual risk waste could be handled by controlled burning.

III.5.4 Estimation of costs of treatment or disposal of wastes, effluents and emissions (if any).
The costs for the running of the biological waste water treatment facilities are covered in the Maintenance and utility costs and estimated to 100 - 150.000 USD p.a. That figure will also cover the eventual outside costs for burning of risk waste and other waste depositions.

III.6 Plant capacity

III.6.1 Identification of the parameters to be used in determining the plant capacity

The investment in production facilities and also to a certain degree in warehouse and other site constructions are of course depending on the chosen production programme and the concluded license agreements.

The following parameters have been identified and used in the determining of the plant from technical point of view:

1. Manufacturing of antibiotics is separated from the other manufacturing units and that includes also a divided warehouse.

2. Each technical production programme must be sized to carry that specific Investment programme.

As a consequense a "dry" unit for uncoated tablets with possibilities to complete with e.g.filmcoating facilities and a "wet" unit for ampoules and vials/bottles has been identified together with an "antibiotic" unit. Production facilities for e.g. effervescent tablets, ointments,suppositories and sachets are excluded but completions can be made any time following the Pharmadule concept.

3. Especially regarding the tablet production there is of certain importance to have a certain basic capacity utilization. The Described production programme gives 87 millions of tablets and a sales figure of about 2,8 millions USD and a gross contribution of about 1,8 millions.

If the product Aspro is excluded from the product list only 23 millions of tablets are produced and giving sales figures of about 2,2 millions USD and gross contribution of about 1,6 millions. Still we think that the production level of 23 millions of tablets is too low as an output from a manufacturing unit and suggest that Aspro as a low price and low contribution product still is included in the programme.

There are of course many other possibilities and variations regarding the production Programme and any change and/or adding of products in order to keep the production output close to 100 millions of tablets is positive to the project and welcomed.

III.6.2 Selection of plant capacity from two or more alternatives, giving reasons for the choice and identifying both nominal and normal feasible capacities. The capacities should be identified both for the complete plant and for each major production unit (tablets, solutions).

1. The investment should cover the estimated sales- and production development for the irst six years of operation (corresponding to roughly a doubled production level) meeting an utilization level of about 90%.

This means that eventual investments for extended capacities and for new product lines should be planned

and desided after about four years of operation and experiences from activities on the market (gives two years for the investment).

2. It is important that the first years of operation also give opportunities for training of the personnel and that fluctuating and sudden market demands can be met by a flexible production unit. That can be done if the planned capacity utilization from the beginning is only about 50% (in accordance with p.1 above).

III.6.3 Estimation of the eventual excess capacities
See III.6.2 above.

Chapter IV

Materials and inputs

Descriptions of raw materials for production of medicine which will cover the profile of the required production programme (quoting national and international standards).

IV.1 Descriptions of process materials, packaging materials and additives required.

IV.2 Descriptions of factory supplies required for continous production.

IV.3 Supply programme of the raw materials, packaging materials, process materials and factory supplies taking into account optimization of the storage and transportation costs at certain batch size.

IV.4 Consumption coefficients and figures of the raw materials, processed materials and per unit of various products manufactured as well as the annual consumption for the profile of the production.

IV.5 Sources of supply of raw materials, processed materials, factory supplies and packaging materials indicating one main supplier and 1-2 alternate independent producers considered as potential suppliers.

IV.6 Unit prices of the raw materials, processed materials, factory supplies and packaging materials indicating fob and cif trends in the last five years as well as showing the contribution margins both in relative and absolute terms.

IV.7 Specification of quality and consumption figures for utilities; water, steam, electrical power, fuel etc.

IV.8 Estimation of the cost of materials and inputs.

NOTE:

The raw material part has been already studied in the above mentioned UNIDO study. It would have to be eventually updated. However, electricity, water, fuel and packaging materials have not been examined and their availability would have to be ascertained as well as their costs. The consultant would have to determine what is available locally and what would have to be imported, determine purchase organization for a very large number of raw materials and the foreign partner's role in the purchasing process.

IV.1-6 Descriptions, Supply Programme, Consumption Coefficients and Figures, Sources and Unit Prices of the raw materials, processed materials, factory supplies and packaging materials.

The average costs for raw materials are calculated based on the information given in the UNIDO report 1989. The agreements with the licensors might change both quality demands, price levels and supplier possibilities but we consider the cost estimations still valid for the purpose of this study. For materials used in dry products the calculated yield is 95% and for the wet products 90%.

The sources of supply of raw materials must be discussed with the licensors and if no obstacles are raised and/or clear specifications are given it is up to APHAS to investigate alternatives to the suppliers listed in the UNIDO report.

All raw materials have to be imported.

The average costs for packaging materials are calculated based on information available in Sweden and reflecting international prices. See Encl. 6.

Also regarding packaging materials the licensors might have special demands that change the basis for the cost estimations but the total influence is considered very low.

The yield levels for the packaging materials are calculated the same as for raw materials.

The sources of supply are not identified. Either do the licensors specify both qualities and supplier's or, if not, it is recommended that some of the suppliers already used by the licensors are also used by APHAS. First priority should be given to suppliers giving close cooperativeness and probably based in France. All packaging material except outer boxes have to be imported. Local production of e.g. labels and cartons are discussed within CFI but not considered in this study.

The costs of process materials and consumables are covered by the manufacturing costs. The materials are not identified nor are the suppliers but the costs are estimated to a total of about 200 TUSD covering the need for the production, QC and Materials Adm. Most of the materials have to be imported.

The following factory supplies are needed.

- Guards
- Canteen
- Laundry
- Infirmary

- Gardener
- Transports of goods and people

The costs for these supplies are estimated and included in the figures in Encl. 5.

IV.7 Specification of quality and consumption figures for utilities.

- Water will be supplied from an own well on the site. Neither quality nor quantities are known but assured by APHAS's specialists as good and enough mountain water.
- Steam as well as distilled water is locally generated within the modular production units.
- Electrical power is supplied by 3000 V(630k) cable passing the site. A transformer station with stabilizer will be built on the site.
- Waste water treatment
- Nitrogen and burning gas (lab).

Consumption figures are more or less impossible to estimate at this stage but the running costs are summarized based on experiences to about 490 TUSD p.a.

IV.8 Estimation for the cost of materials and inputs.

The costs related to the figures valid for 1989 can be summarized as follows:

- Raw materials	1000 TUSD
- Packaging materials	1500 "
- Process material and consumables	200 "
- Factory supplies	233 "
- Utilities	490 "
Total	3423 TUSD

These figures except those for raw materials are estimations based on our experiencies from and situations within similar companies based in Sweden and other countries.

The costs are estimated relatively high and by that also covering unforeseen costs or incorrectnesses regarding basic facts.

We think this is a better and even more correct calculation method for the cost evaluation of the running production and for the purpose of a feasibility study than trying to identify and summarize a lot of more or less correct detail costs.

We consider the risks for cost surprises compared to our estimations as very low.

The price of land in Likomba is about 1/10 of the price in Douala which means about 2 D/m2. 25 ha are offered to CFI for the same price as is originally calculated for the APHAS project (2,5 ha). The costs for the site preparation will be higher in Likomba compared to Douala.

Together these costs are estimated to about 700 thousands of USD or 220 millions of CFA.

The rest of the local investment (about 6.3 millions of USD = 1780 millions of CFA) is covering site constructions, all buildings, all civil works and preoperational costs incl. interests and working capital.

Chapter V

Location and site

V.1 A short description of the country, city, local conditions, infrastructure and location. Cost for site preparation. The price of land should be determined at one main site and one alternative site.

V.1 A short description of the country, city, local conditions, infrastructure and location. Cost for site preparation. The price of land should be determined at one main site and one alternative site.

The location of the site for the APHAS project is decided based on economical and governmental strategic reasons. It will be located about 60 km outside of Douala in the western coastal area and close to the road to Limbe. The place is called Likomba and the site will be located on the hills of the Cameroon Mountains. It is a forest area where about 2,5 ha have been reserved for this project. Nothing is, so far, done regarding landpreparation, roads etc in this appointed industrial area (see map Encl.7).

No alternatives to this location is discussed in this study.

The climatic conditions in this area are called "Cameroonian" with very high humidity and also high temperature. As an average there are 250 raindays per year. The rainy period lasts from March to November with the most humid period in July to September.The most dry period is December.

The temperature variation is 24-31oC with an average temperature of 26oC.

In 1987 Douala registered 200 raindays and an amount of 3158 mm.

The relative humidity level is always higher than 65%.

The road from Douala to Limbe is of good quality which is important as most of delivered goods, equipment and material will arrive to Douala, the main sea- and airport of Cameroon.

Telephone, telex and telefax are functioning services even if they are highly utilized and the capacity is sometimes insufficient.

For details see the enclosed summary of statistics regarding the situation in Cameroon (Encl.8).

The investments on the site can be calculated based on the estimates made by APHAS in their study from 1987. The introduction of the PHARMADULE concept changes the assumptions for the investment but most of the figures are still valid. The total investment is by us estimated to 15 millions of [illegible] or 4.400 millions CFA. Almost half of the investment is local and a good half is connected with the PHARMADULE concept and the complete production units.

The price of land in Likomba is about 1/10 of the price in Douala which means about 2 D/m2. 25 ha are offered to CFI for the same price as is originally calculated for the APHAS project (2,5 ha). The costs for the site preparation will be higher in Likomba compared to Douala.

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Chapter VI

Project Engineering

It is assumed that the buildings for process, utilities and laboratories are constructed according to the Pharmadule concept i.e. prefabricated steel modules with all equipment installed. Less critical buildings as warehouse, administration, workshop etc. are constructed locally with conventional technique. This segment will of course define the scope of the project and will include.

VI.1 Project layouts

VI.1.1 Preparation and description of optimum project layouts with alternatives if necessary such as:

VI.1.2 An overall plant layout, 1:1000, showing boundary and internal rail road and river through-fares.

VI.1.3 Building outlines, 1:400, with plan and section identifying basic design and type of construction.

VI.1.4 An outline of civil works, 1:400, identifying basic design and type of construction.

VI.1.5 A plant (equipment) layout, 1:100, with brief explanation of raw material flows, production in process and finished products storage, work areas and access routes (material, people and production flows).

VI.2 Technology and equipment

VI.2.1 Review of licensor's suggested technologies justifying labour/capital intensity etc.

VI.2.2 Discussion/recommendation for foreign management contract/technical assistance from plant suppliers and others.

VI.2.3 An estimate of costs of any technical assistance recommended.

VI.2.4 Selection and functional specifications of major items of process equipment of plant quoting capacity, type as appropriate.

VI.2.5 Listing of major auxilliary and service plant and equipment required.

VI.2.6 An estimate of costs of major items of equipment together with an explanation of the spares estimate and an allowance for consumable hardware and tools.

VI.3 Civil engineering

VI.3. Selection and precise description of the civil engineering. The civil works should be subdivided into: site preparation and development, main building structures, floor slab foundations, roofing and cladding, auxilliary works and buildings.

VI.3.2 An estimate of costs of all civil works as subdivided above.

VI.1 Project layouts

VI.1.2 An overall plant layout, 1:1000, showing boundary and internal rail road and river through-fares. See Encl. 9.

The rectangular area of about 12.000 m2 is dominated by the main building but includes also supply buildings for power transformation, water and waste water treatment as well as garage and guard house. The expansion discussed in this study for roughly a ten year period can be handled within this area.

It is still advisable to make the earlier discussed reservation of 25000 m2 which gives many options and possibilities for future expansions and completion project ideas.

VI.1.3 Building outlines, 1:400, with plan and section identifying basic design and type of construction. See Encl. 10.

The main building is outlined in two floors with the connected administration building about 6 m and the warehouse about 8 m high.

Connected to the warehouse are also the three modular production units for antibiotics, wet products and dry products and also the QC unit. One utility module is placed on each of the production units.

Final packaging areas are outlined on the ground floor in the warehouse area and connected to the production units.

Laundry, cold store, label store, ref. store, waste handling,receiving and delivery of goods and material and workshop are functions and units that are also outlined on the ground floor.

Changing rooms as entrances to manufacturing areas are outlined on the first floor above the packaging and service areas with spiral starcases leading to the ground floor. Ventilation and air conditioning units can preferably be placed and are outlined above the receiving and delivering areas for goods. The canteen is also outlined on the first floor with access from both administration building and changing rooms.

The warehouse is divided to separate the handling of and the manufacturing of antibiotics.

The warehouse area is roughly 1800 m2 giving space for about 1400 pallets in 4 levels.

VI.1.4 An outline of civilworks, 1:400, identifying basic design and type of construction.

The civil works are not outlined in detail in this study.

VI.1.5 A plant (equipment) layout, 1:100, with brief explanation of raw material flows, production in process and finished products storage, work areas and access routes (material, people and prodction flows). See Encl. 11,12,13,14,15.

The modular production, QC and utility units are outlined in detail according to the discussed product programme.

Extension with other production techniques are indicated on the drawings.

Both staff and material enters through locks from the warehouse.

After different production steps the products leave the production areas as primary packed products (blisters, bottles, vials, ampoules) which are finally packed within the connecting packaging areas.

Each production unit consists of four modules (each one 11x3,6x3,5 m) = 160 m2 and the QC unit of three modules.

The utilities needed for the production (compressed air, distilled water, steam, softened water, chilled water, electricity and process ventilation) are collected in three modules. These would preferably be placed on top of the three production units giving access from the inside corridor in the changing room area.

Raw materials for antibiotics as well as laundry of clothes for that area are handled and kept separately. Totally eighteen modules with extension possibilities with three more modules are outlined in these drawings.

VI.2 Technology and equipment

VI.2.1 Review of licensor's suggested technologies justifying labour/capital intensity etc.

We have in this study assumed that the product technologies are correct and valid as they are described and listed in the UNIDO report.

The three production lines are identified and outlined based on these technologies and the chosen product mix.

The different production steps within each technology

are not in any case checked with potential licensors but outlined as general steps and procedures within the technologies.

We think that the result from the license discussions might be ideas, limitations, suggestions or demands regarding the choice of equipment but hardly not any changes regarding the principal production procedures.

As an avarage we have estimated a need of about 15 people including supervisors for each production unit taking care of all operations from weighing of raw materials to final packaging.

VI.2.2 Discussion/recommendation for foreign management contract/technical assistance from plant suppliers and others.

We have considered the following foreign management assistance as essential for the project:

1. Preoperation period
   - one neutral project manager reporting to the project board and with responsibility for costs and timing regarding both the local and the abroad investment.
2. The first two years of operation
   - Technical assistance for the starting up of production from Pharmadule and/or from the licensors if needed. This assistance shall cover not only the techniques but also the systems for Materials administration, Maintenance, Documentation of validation and Operating procedures.

VI.2.3 An estimate of costs of any technical assistance recommended.

About 1 million of USD are estimated to cover all the technical assistance as described above.

VI.2.4 Selection and functional specifications of major items of process equipment of plant quoting capacity, type as appropriate.

1. Manufacturing unit for "Dry" products

Type of products

Uncoated tablets packed in blisters.

Invested capacity

Uncoated tablets	100-150" tablets p.a.
Blisters	8-10" blisters p.a.

Major equipment	Capacity
2 Scales	
1 Intensive mixer	60 kg/batch
1 Granulator	80 kg/batch
1 Fluid bed dryer	60 kg/batch
1 Final mixer	200-400 kg (500-1000 l)
2 Tabletting machines	100.000/h, 200.000/h
1 Blister packaging machine	15.000/h
Internal transport/ storage containers	

Sizes and capacities have to be decided based on the methods provided by the licensors and the optimized batch sizes. The figures above are only indications.

2. Manufacturing unit for "Wet" products.

Type of products

Ampoules for injection	1-7 ml
Bottles with oral solutions	75-200 ml
Vials " " suspensions	15-100 ml

Invested capacity

Sterile ampoules	6-8" ampoules p.a.
Bottles	700'bottles p.a.
Vials	1.5" vials p.a.

Major equipment	Capacity
2 preparation vessels 50 l	
2 " " 20 l	
1 Hot air sterilizer	
1 Ampoule filling machine	6000/h
1 Ampoule sterilizer	
4 Inspection machines	2000/h
1 Labelling machine	6000/h
2 Preparation vessels 1200 l	
2 " " 500 l	
1 Vial/bottle washing machine	
1 Stopper washing machine	
1 Homogenizer	
1 Filling machine for vials/bottles	
Labelling and packaging lines	

Sizes and capacities have to be decided based on the methods provided by the licensors and the optimized batch sizes. The figures above are only indications.

3. Manufacturing unit for "Antibiotics".

Type of products

Hard gelatin capsules
Powder for injection in vials
Powder for reconstitution into oral solutions or suspensions

Invested capacity

Hard gelatin capsules	3-4" capsules
Powder for injection	2" vials
Powder for oral solutions or suspensions	0,5" bottles

Major equipment	Capacity
2 Scales	
1 mixer	
1 Granulator	
1 Dryer	
1 Final mixer	
1 Capsule filling machine	5-10.000/h
1 Washing machine for stoppers	
1 " " for vials	
1 Hot air sterilizer	
1 Powder filling machine	5-10.000/h
2 Preparation vessels 1000 l	
1 Bottle filling machine	2-3.000/h
Labelling & packaging lines	

Sizes and capacities have to be decided based on the methods provided by the licensors and the optimized batch sizes. The figures above are only indications.

VI.2.5 Listing of major auxilliary and service plant and equipment required.

The utilities needed for production are outlined in the utility modules:

Water distiller	500 l/h
Holding tank	3-5000 l
Steam generator	6-8 bar
Compressed air	6 bar
Chilled water	
Ventilation and air filtering equipment	

Beside these main utilities directly supporting the production units there are also needed

Power transformation station	220/380 V
Back-up power generator if required	
Waste water treatment	
Cold storage	
Air conditioning	
Laundry machines	

Details regarding these and other equipments can only be specified when the project is really started and all facts and informations are available.

VI.2.6 An estimate of costs of major items of equipment together with an explanation of the spares estimate and an allowance for consumable hardware and tools.

The total investment costs for the modular manufacturing concept including laboratory and utilities and the software are estimated to a good half of the total investment cost or 8.0 million USD. Roughly 1/4 of these costs are costs for the modules and almost 2/3 are costs for equipments including also packaging equipment placed in the warehouse building.

This estimation and the equipment listing for the production units are based on figures and details presented in a Pharmadule budget offer to APHAS dated Nov.-89 covering the whole production programme as outlined in the UNIDO report.

Costs for spares and consumables are as running costs estimated to totally 200 TUSD related to the 1989 situation.

VI.3 Civil engineering

VI.3.1-2 Selection and precise description of the civil engineering. The civil works should be subdivided into: site preparation and development, main building structures, floor slab foundations, roofing and cladding, auxilliary works and buildings.
An estimate of costs of all civil works as subdivided above.

The description and the figures regarding the investment that are given in the feasibility study carried out by APHAS in 1987 are used with some small corrections also for this study. The civil engineering investment reaching a total of 5.5 million USD is divided as follows.

Land and preparation of land, site and roads	0.7 million USD
Buildings	2.0 " "
Engineering and civil work reg. e.g. water, power and waste treatment	0.5 " "
Interior furnishing and equipment	1.5 " "
Transport cars and trucks	0.3 " "
Others	0.5 " "

The total of building areas is as a consequence of chosing the PHARMADULE concept reduced by about 25% comparing with the APHAS study but we have only reduced the corresponding costs by 10%.

Chapter VII

Plant organization and overhead costs

This section of the report is concerned with the organizational planning of the project such as dividing the plant into component groups as production, services,administration, allocating cost centres to these components and identifying the overhead costs to be allocated to them.

The scope should also include:

VII.1 Cost centres

VII.1.1 Discussion of the various types of cost centres (production,services,administration);

VII.1.2 Selection and description of the cost centres explaining alternatives,if considered and justifying selection made;

VII.1.3 A listing of the selected cost centres

VII.2. Overhead costs

VII.2.1 Description of the composition of the overhead costs (management,marketing,quality assurance, development etc) stating reasons for their inclusion.

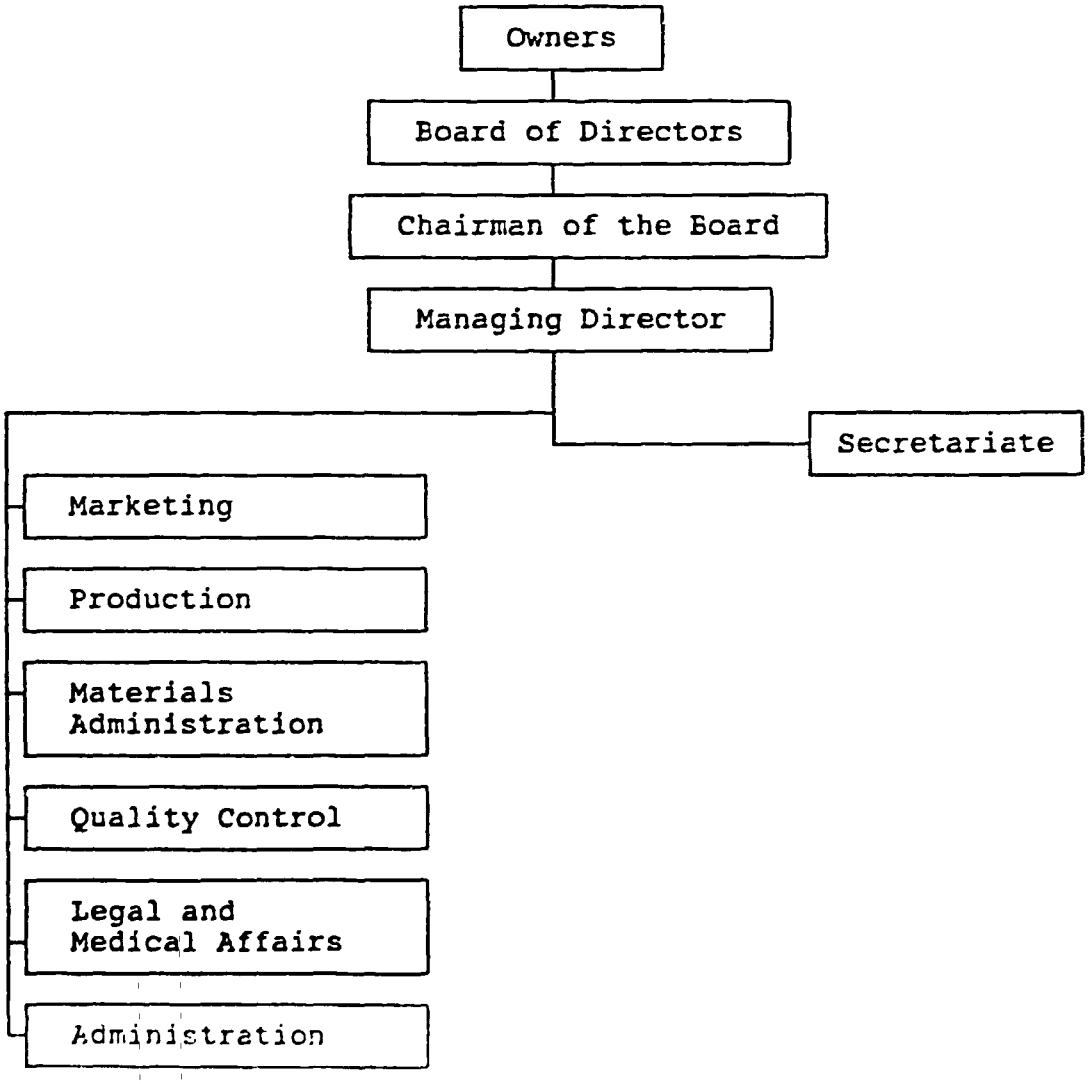
First of all we would like to comment that the wording "Plant organization" is a little bit limited to our liking.
We would prefer to use the word "company organization" since more functions than the plant are constituting the company.

Secondly we are not following exactly the structure of the Terms of Reference in this chapter since we have not found it convenient.The content of the chapter covers however the Terms of Reference.

APHAS is in the beginning going to be a company of a rather modest size with a rather low complexity with regard to marketing, production and other activities. Therefore we would suggest that APHAS starts out with a straightforward "functional" organization.

At a later stage and when the company grows and develops its range of activities it will have to adapt its organization accordlingly.

The functional organization we envisage will look like this:



The suggested organizational structure has two elements that perhaps need a bit of elaboration:

* Materials administration

Traditionally this function belongs to the production department but we propose to attach it to the same level as production and the other departments for the following reasons :

1. Then the production management and production department can concentrate on the production process itself and not be burdened with the logistic problems outside the production walls.

2. Materials administration is nowadays becoming an increasingly important activitiy in the optimization of materials flow in order to rationalize the use of capital.In this way we want to recognize this importance

* Legal and Medical Affairs Department

We have deliberately avoided to label this function Research and Development in order not to create the wrong impression and false expectations.

However APHAS will need a function to take care of the described activities :

1. Modern pharmaceutical manufacturing is largely managed by written instructions and records.

   In the case of APHAS these records emanates from the licensors mainly but some streamlining will have to be done with the Standard Operating Procedures by the company and most certainly approved by the licensors. Therefore APHAS will need a "translating/adaption" facility. A lot of the documentation will also probably be in English and has to be translated into French.

   The staff has also to be trained to comply with the instructions.

   Furthermore the documentation from the licensors will be changed and updated from time to time and some organizational entity within APHAS must have the responsibility to update the APHAS files inform and train the staff.

3. Pharmaceutical preparations will have to be registered with the health authorities and APHAS will need some competence to conduct that dialogue with the help of the licensors. Furthermore APHAS will most probably need some in-house medical competence to provide a knowledge base for the marketing activities,

to follow publications and perhaps to conduct clinical trials.

The other functional departments do not need particular justifications for their inclusion.

In case that the managing director, the marketing department and parts of the administration will be physically separated from Likomba to be located in e.g. Douala we suggest that the production manager will be appointed plant manager also.

We will now continue with the structures of the respective departments:

1. Owners, Board of Directors, Chairman of the Board, Managing Director and Secretariate.

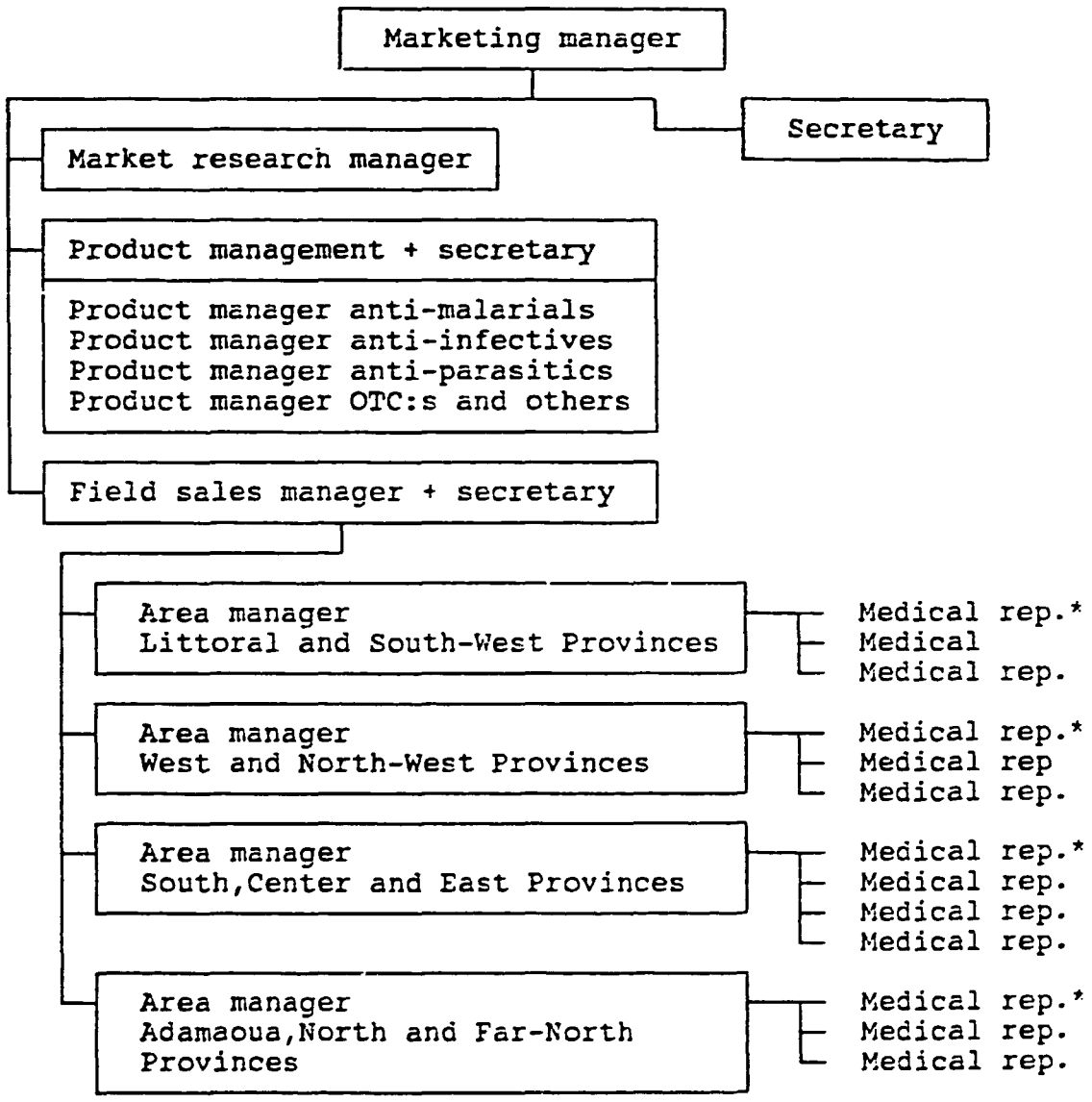
No special comments are needed.

2. The marketing department.

One of the basic elements for the success of APHAS is that the marketing is conducted in a considerably more professional and systematic way than the competition.

This has served as our guideline when designing the organizational structure of the marketing department.

This is how we envisage the marketing department:



Comments:

2.1 Market research

Especially at the beginning of the life of APHAS we would like to recommend that this staff function is established.

Later on, when the product managers, have come into action they should take over the market research work.

2.2 Product management

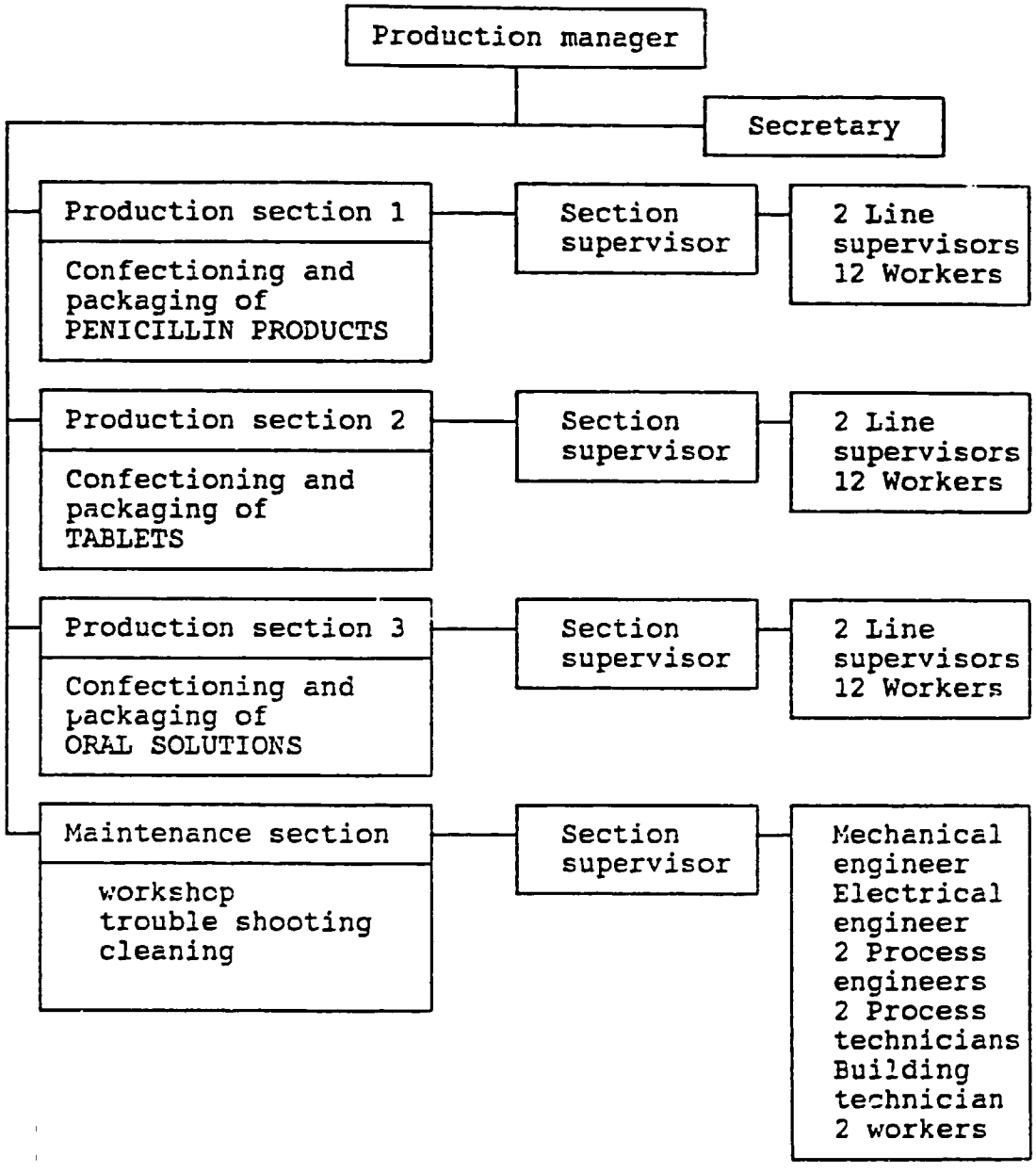
We recommend to establish a product management organization centred around the main indications.In this way APHAS will enhance the business strategies and keep in line with market and medical developments. The product managers report directly to the marketing manager.

2.3 Sales management

The area managers can have double functions: being sales supervisors for the region and at the same time be medical rep's for a limited number of clients (*).

3. Production department

The organization of the production department is suggested as follows:



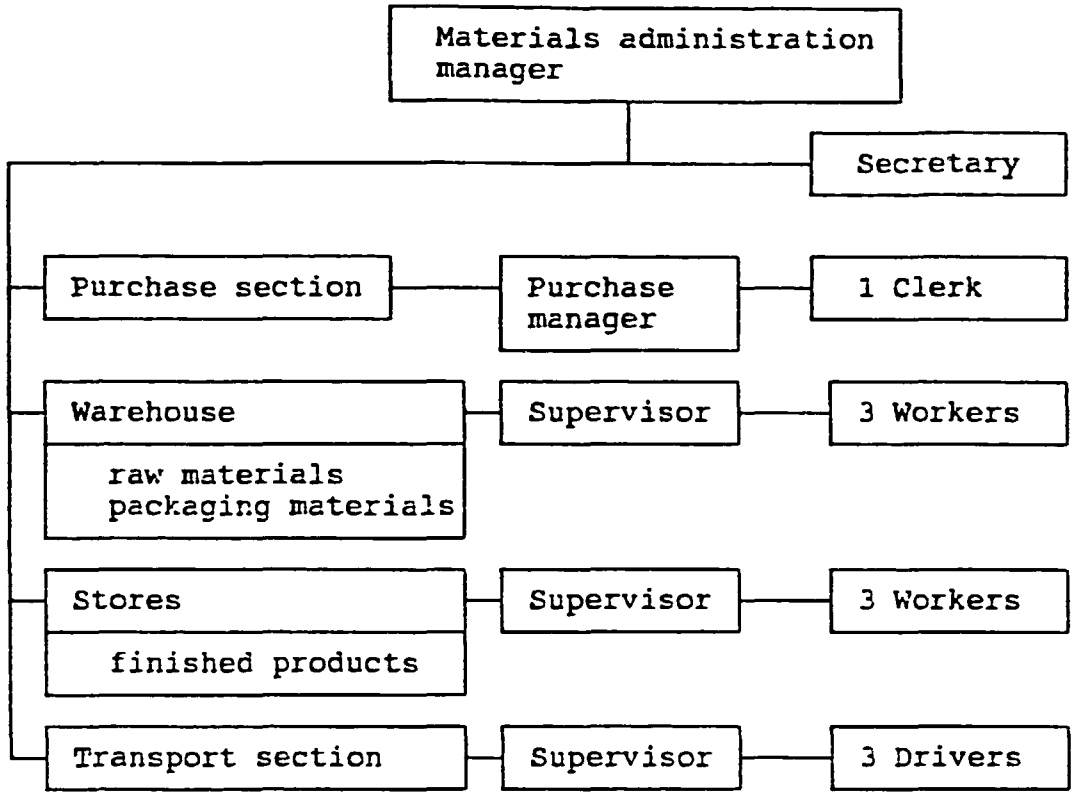
Comments:

1. Planning and materials administration is separated organizationally from Production.

2. Process trouble shooting will in this organization be the responsibility of the maintenance section. The communication with the licensors is the responsibility of the production manager.

3. Process cleaning is done by the workers at the production lines. Production waste handling is done by Maintenance. Maintenance is also responsible for power plant etc. Cleaning of offices, laboratories, canteen etc. is the responsibility of Administration

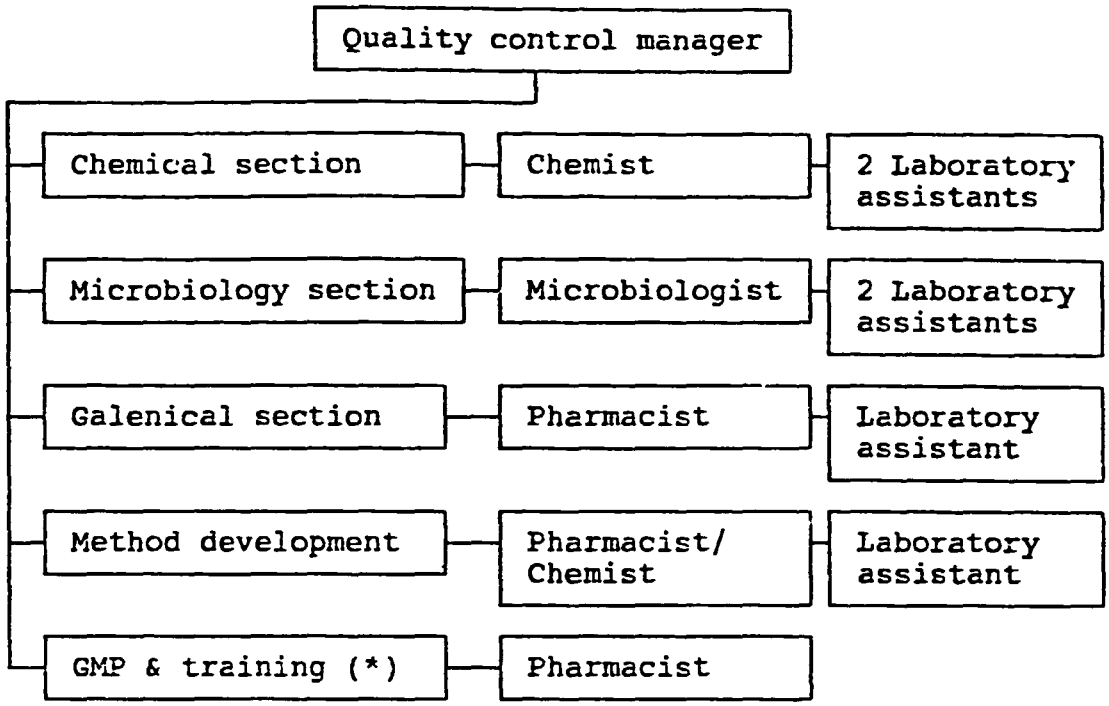
4. Materials administration department



Comments:

No further comments.

5. Quality control



Comments.

1.No animal testing is anticipated

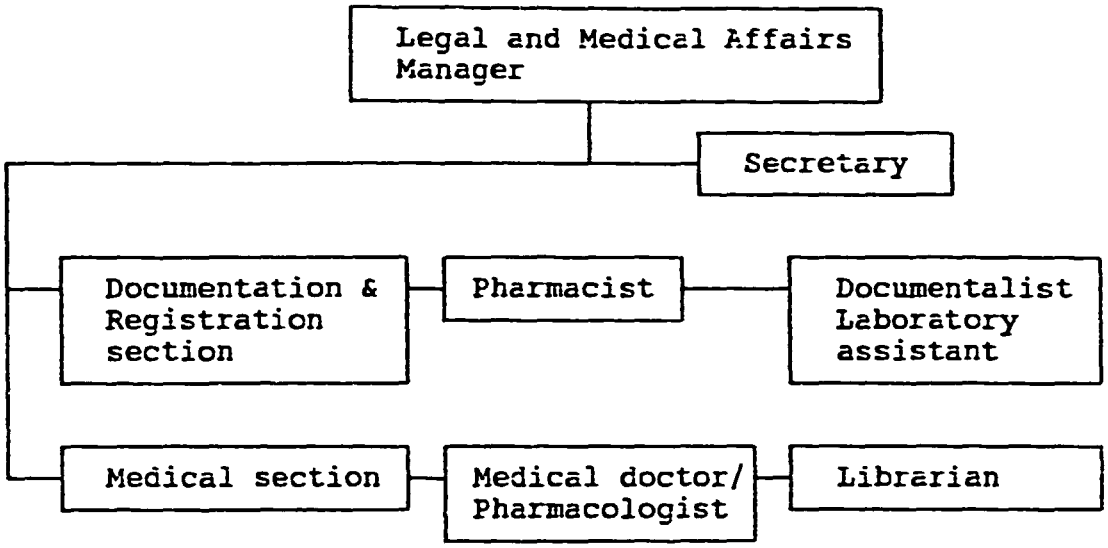
2.If the QC manager has suitable background the GMP & training person may be omitted.

3.Method development.APHAS will not conduct research and as long as the main business is license products no real development work. The process trouble shooting is handled by the maintenance section of the production department.

We would recommend however that some resources for method development purposes are established. We have attached a group it to the QC department to avoid doubling of laboratory resources.

When suitable, at a later stage, it can be combined with Legal and Medical Affairs to form a Development department.

6. Legal and Medical Affairs Department



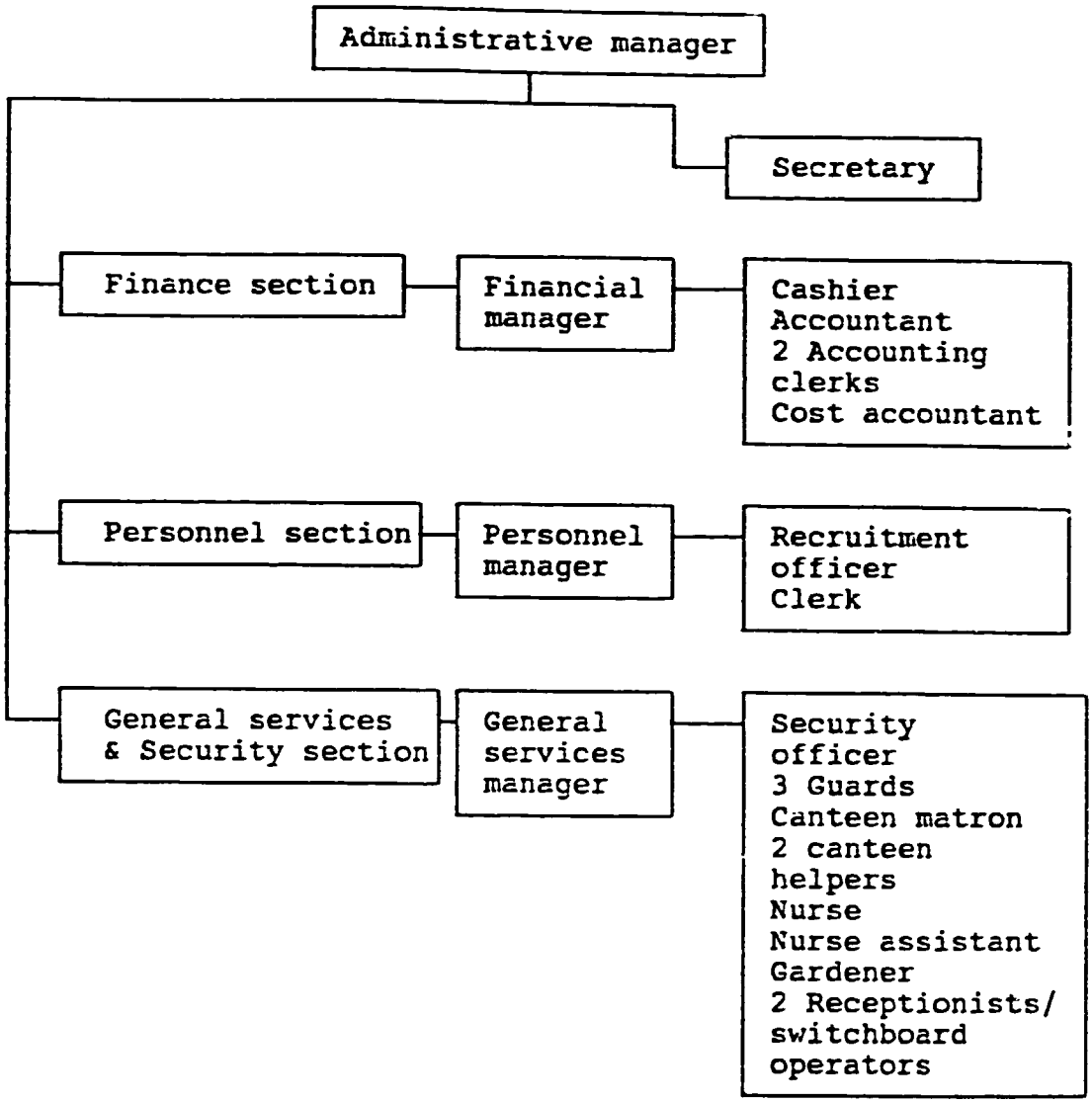
Comments:

1.The creation of this department at this organizational level is logically derived from the ambitions outlined in the business strategies of APHAS and an important instrument in creating the "external efficiency" that is planned to be the trigger to domination on the market.

The importance of a professional and well-lubricated company machinery in dealing with e.g. the medical authorities cannot be overestimated.

2.If APHAS shall live up to the ambitions in the business strategies we think it is important that the company has resources to follow and evaluate the research work and the publications of the licensors as well as the international literature in its fields of specialization in order to support management and the marketing department.

7. Administration department



Comments:

This suggested organization has to be adapted to local conditions and requirements.

Cost consequences of the selected organization structure:

These consequences are outlined under Chapter X.

Chapter VIII

Manpower

In establishing the manpower requirements of the project the consulting company would be expected to evaluate the availability of local and foreign labour and the levels of skill and and training required.The scope of work for this section of the study should include:

VIII.1 Labour

VIII.1.1 Selection and description of the manning table with subdivisions as previously mentioned and with chart(s) showing the organization structure

VIII.1.2 An estimate of the annual labour costs (subdivided into variable and fixed costs) for each year until nominal feasible capacity is attained.

VIII.2 Staff

VII.2.1 Selection and description of the staff manning table indicating the scope of responsibility (with charts as required) and giving reasons for the selection

VII.2.2 An estimate of the annual costs of local and foreign staff

VII.2.3 Training.Short description of the training programme and the cost involved.

As for the availability of local and foreign labour the reader is requested to turn to the relevant headings under Chapters IX and XII respectively.

VIII.1.1 Selection and description of the manning table with subdivisions as previously mentioned and with chart(s) showing the organization structure

VIII.2.1 Selection and description of the staff manning table indicating the scope of responsibility (with charts as required) and giving reasons for the selection

For the staff and labour manning tables the reader is requested to consult Enclosure 16

VIII.1.2 An estimate of the annual labour costs (subdivided into variable and fixed costs) for each year until nominal feasible capacity is attained.

VIII.2.2 An estimate of the annual costs of local and foreign staff

For details on labour and staff costs the reader is requested to turn to the relevant headings under Chapter X

VIII.2.3 Training.Short description of the training programme and the cost involved.

The training programme runs in two phases:

Phase 1 Training of key personnel at the premises of the licensors and at the site of the assembly of modules. This training encompasses the following 15 people:

General manager
Marketing manager
Market research manager
Field sales manager
Production manager
4 Production section supervisors
MA-manager
Purchase manager
QC manager
Chemist
Microbiologist
Legal and Medical Affairs Manager

The curriculum of this training programme has to be adapted to the experience and background of the individual managers so that e.g. basic knowledge is not unnecessarily repeated but aspects as :

QA
GMP
QC
Production technologies
Standard Operating Procedures
Operation of process and utility equipment
Maintenance of equipment and modules
Materials administration
Management
Legal affairs, registration and documentation
Marketing, market research and sales management

have to be included.

The managers should whenever possible circulate between the main licensors but the length of the various individual programmes should vary from "study visits" to actual operative activities with the licensors to pick up information relevant to the pursuit of the various tasks.
We have estimated an average of three months training programme per capita which may vary considerably between the individuals.

We would also recommend that the licensors are requested to send experts to Cameroun under the license agreement and in connection with the setting up of analytical methods, manufacturing menthods etc.

The cost for the Phase 1 training programme has been estimated to 200 TUSD.

We don't find it useful at this stage to go into more details lacking specific information about the individuals but we have applied our knowledge from other similar projects where, as a rule of thumb, 3 - 6 months training is required for people <u>with</u> a background in pharmaceutical industry and 6 - 12 months for people <u>without</u> this background or for freshly graduated pharmacists.

Phase 2 This training phase which stretches over the larger part of 1992 and including the start-up of operations should be focused on the remaining parts of the staff and labour.

Subjects should cover e.g.:

Basic information about the company, its purpose and objectives
Basic knowledge about pharmaceuticals
Basic knowledge about hygiene, safety regulations and GMP requirements

Instruction and training of operators

The planning, design and execution and follow-up of the training programmes should be the responsibilities of the various managers and supervisors with support from the technical partner and the licensors.

The costs for carrying out this Phase 2 programme are mainly salaries and have thus been calculated into the pre-operating expenses.See Chapter IX and X for details.

Chapter IX

Implementation scheduling

Implementation scheduling should commence from the date of authority to the selected consulting company to proceed with the feasibility study and should continue thorugh the whole implementation period until the end of the guarantee period of the supply contract or the end of any technical assistance contract,whichever is the later.The scheduling implications of aid and/or types of loans shoudl be discussed in this section of the study as well as the implications of investment or other delays to the programme

The scope of work should include:

IX.1 Statement for fundamental data for project implementation considering:

- project management
- detailed engineering
- tendering
- implementation of civil works
- supply of technical assistance
- arrangements for financing

The scheduling implications of

- supervision
- testing and taking-over

should be explained and reference should be made to the build-up of

- management and administration
- marketing and sales
- production
- quality assurance
- development
- arrangements for training and approval of authorities

IX.2 Selection and desription of the optimum implementation programme showing the activities,their time frame and sequence (in bar chart,and/and or network form)

IX.3 A cost estimate of any activity brought about by scheduling not covered by previous sections of the study.

Overleaf the reader will find a summary Implementation Schedule.

In Enclosure 17 the reader will find a comprehensive time schedule for implementation scheduling of the project.

Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
1.	PREPARATORY STEPS	.####	#.....	.....
2.	FINAL DESIGN	....#	##.....	.....
3.	DETAIL DESIGN	.....	####.....	.....
4.	PRODUCT FILES, INSTRUCTIONS, TESTS	.....	##########	##########
5.	EDUCATION AND TRAINING	.....	..##....####	###.####....
6	EQUIPMENT DELIVERY AND INSTALLATION	.....	##########	##.....
7.	DELIVERY OF PLANT	.....	.....	.#######
8.	WORKS AND PREPARATIONS BY OWNER	....#	##########	##########

IX.1 Statement for fundamental data for project implementation:

IX.1.1 Time schedule

The project implementation time embraces the time for the finalization of the feasibility study in Sept, 1990 to the commissioning for full scale commercial production scheduled to Sept. 1992.

IX.1.2 Project start

The start of the project is scheduled to Nov. 1990 after the investment decision taken by the parties based on successful negotiations with the proposed licensors. A delay regarding this investment decision will cause the corresponding delay regarding the start of commercial production.

IX.1.3 Engineering and design

Engineering and design will start as soon as the project starts both for the modules and the site construction work. A resident and neutral project manager should be appointed by the owners responsible for costs and timing reg. the total project.

The final design is very much depending on the requests given by the licensors and gives the basis for the procurement of equipment which must start in Febr. 1991.

The detail design must be finalized in April 1991 when construction of modules and local buildings are scheduled to start.

IX.1.4 Procurement of equipment

The procurement of equipment has to be scheduled depending on delivery times and scheduled installation periods. We have estimated delivery times varying from 9-12 months in this schedule.

IX.1.5 Construction

Site preparations and construction of the buildings, together with foundations for the modules, have to be started as soon as the layout and engineering is ready. The site constructions must be ready when the modules arrive in April 1992.

The building of the modules must be finalized in Oct. 1991 to meet the installation of equipment and must be started about 6 months earlier.

IX.1.6 Reassembling of the modules at the site

The reassembling of the modules at the site docked together with the ready warehouse is scheduled to May-July 1

Personnel from the supplier will do part of the work and serve as supervisors during this phase.

IX.1.7 Tests and running in

The equipment must be tested and the personnel aquainted with it before the running in period starts. Minor adjustments have to be made but the running-in time can be kept to a minimum as the process equipment in the modules has already been tested before delivery.

IX.1.8 Employment

The general manager should be employed as quickly as possible so that he can take part in decisions, which have to be made during the project time.

The managers of Production, Materials administration, Quality control, Maintenance and some other key personnel, who have to participate in education and training, must be employed in good time before the modules are ready for assembly, test run and validation in Sweden. Part of their education and training should be given at the licensor's manufacturing plants.

Marketing staff have to be employed at an early stage, as their mission is to build up an organization, able to market imported products before the own production starts.

Supervisors are employed before the workers with the intention to give them a proper skill and educational background concerning for example the handling of the factory, production procedures, quality aspects, hygiene etc. The education is given locally by the managers but also abroad e.g. at licensors plants.

The supervisors are in their turn responsible for the education of the workers.

IX.1.9 Instructions and manuals

Instructions and manuals will be made in cooperation with the equipment suppliers and personnel from licensors and PHARMADULE.

IX.1.10 Mast: files and documentation

This substantial material is mainly supplied by the licensors and PHARMADULE and will serve as guiding and governing documents for production, process and quality control.

This includes also Materials management and Maintenance systems as well as a lot of Standard Operating Procedures.

IX.1.11 Cost of implementation

The costs during the implementation period are summarized in chapter X.1 as preoperational costs.

IX.2 See Encl. 17

Chapter X

Commercial profitability

This chapter should indicate what is the profit generated by the project and what are the chances that this profit would be attained over the project's life time.it should summarize all the cost items identified in the previous chapter and compare them with the expected sales volume.The following items should be examined in order to answer the questions related to profitability:

X.1 Total investment cost

(Tabulation of the investment costs identified in previous sections of the study presented in foreign and local currencies)

X.1.1 Preoperational costs (specify time period for preoperations)

X.1.1.1 Feasibility study
X.1.1.2 Project design
X.1.1.3 Installation
X.1.1.4 Test run costs
X.1.1.5 Interest during pre-operation phase
X.1.1.6 Export credit guarantee fees
X.1.1.7 Others

X.1.2 Investment in fixed and immaterial assets,depreciation period.

X.1.2.1 Land and buildings
X.1.2.2 Machinery and equipment
X.1.2.3 Vehicles
X.1.2.4 Freight and insurances
X.1.2.5 Indicate reinvestments
X.1.2.6 Know-how
X.1.2.7 Others

X.1.3 Working capital

X.1.3.1 Stock in raw material
X.1.3.2 Work in progress
X.1.3.3 Stock of finished goods
X.1.3.4 Cash
X.1.3.5 Accounts receivable
X.1.3.6 Accounts payable

X.1.4 Project financing

X.1.4.1 Share capital and its distribution among the parties.Payment in kind.Payments in foreign and local currencies respectively.
X.1.4.2 Export credits
X.1.4.3 Local loans
X.1.4.4 Other foreign lenders
X.1.4.5 Local overdraft
X.1.4.6 Grants/Aid,if at all
X.1.4.7 Specify interest rates,grace period and repayment

plan

X.1.4.8 Specify interest on short-term holdings in local bank

X.1.5 Total production costs

X.1.5.1 A calculation of total production costs from summaries of cost items in previous sections of the the work,estimating thereon an annual basis in accordance with plant utilization.

X.1.5.2 An estimate of unit costs

X.1.6 Sales revenue/Financial evaluation

X.1.6.1 Presentation of basic financial statements

cash flow table
balance sheets
profit and loss statements
presentation of taxes,tax exemptions,dividend policy etc,
calculation of pay-off period,pay of with interest rate consideration,internal rate of return (interpretaion of reults)
sensitivity analysis

X.1 Total investment cost

		US dollars			
X.1.1	**Preoperational costs**	1990	1991	1992	Tot.
X.1.1.1	Feasibility study	120'			120'
X.1.1.2	Project design		250'		250'
X.1.1.3	Project management and systems		350'	135'	485'
X.1.1.4	Education and know-how		100'	200'	300'
X.1.1.5	Installation			200'	200'
X.1.1.6	Test run costs			150'	150'
X.1.1.7	Interest during pre-operational phase		600'	1157'	1757'
X.1.1.8	Export credit guarantee fees				
X.1.1.9	Direct and Indirect costs		100'	850'	950'
X.1.1.10	Others		33'	33'	66'
	Total	120'	1433'	2725'	4278'

X.1.2 Investment in fixed and immaterial assets, depreciation period

		1990	1991	1992	1993	Tot.
X.1.2.1	Land and buildings incl. furnishing & equipm		2500'	1700'		4200'
X.1.2.2	Modules, machinery and equipm		2500'	3700'	800'	7000'
X.1.2.3	Vehicles		100'	200'		300'
X.1.2.4	Freight and insurances			300'		300'
X.1.2.5	Indicate reinvestment		1000'/year from 1995			
X.1.2.6	Others			200'		200'
X.1.2.7	Preoperational costs		600'	900'		1500'
X.1.2.8	Working capital		500'	1000'		1500'
	Total					15000'

Depreciation:	Civil work & buildings	5% p.a.
	Equipment	10% p.a.
	Cars	25% p.a.
	Preoperational costs	20% p.a.

X.1.3 Working capital

X.1.3.1 Stock in raw material	4-6 months = 1050'
X.1.3.2 Work in progress	1 month = 200'
X.1.3.3 Stock of finished goods	1 month = 500'
X.1.3.4 Cash	
X.1.3.5 Accounts receivable	2 months = 950'
X.1.3.6 Accounts payable (L/C)	0 months = 0'

X.1.4 Project financing

X1.4.1 Share capital and its distribution among the parties. Payment in kind. Payments in foreign and local currencies.

X.1.4.2 Export credit

X.1.4.3 Local loans

X.1.4.4 Other foreign lenders

X.1.4.5.Local overdraft

X.1.4.6 Grants/Aid, if at all

X.1.4.7 Specify interest rates, grace period and repayment plan

X.1.4.8 Specify interest on short-term holdings in local bank.

For all assumptions regarding sources of financing, conditions etc. the reader is referred to Encl.22

X.1.5 Total production costs

X.1.5.1 A calculation of total production costs from summaries of cost items in previous sections of the work, estimating thereon an annual basis in accordance with plant utilization.

The production costs are defined as and include:

- direct and indirect salary costs for production and maintenance.
- spare and consumable costs related to production.
- utility costs for production.

The manufacturing costs are defined as and include:

- production costs as specified above.
- QC costs (salaries, consumables, utilities)
- Materials administration costs (salaries consumables, utilities.
- Raw material and packaging material costs.

The factory costs are defined as and include:

- manufacturing costs as specified above.
- marketing costs including royalties
- factory supply and administration costs.
- other preoperational technical costs.

Based on these cost definitions the following table based on the 1989 situation forms the basis for the cost and cash flow presentation in encl. 4. All figures in US dollars p.a.

Production costs		
Salaries (57 people)	760'	61%
Process consumables	167'	13%
Utilities	323'	26%
QC costs		
Salaries (13 people)	173'	80%
Consumables	14'	6%
Utilities	30'	14%
Materials administration costs		
Salaries (16 people)	213'	58%
Consumables	19'	5%
Utilities	137'	37%
Raw material costs	1,000'	
Packaging material costs	1,500'	
Manufacturing costs		
Salaries (86 people)	1,146'	26%
Consumables	200'	5%
Utilities	470'	11%
Materials	2,500'	58%
	4,336'	

Marketing costs		
Salaries and activities (24 people)	352'	53%
Royalties	317'	47%
	669'	
Administration, Legal & Medical affairs		
Salaries (18 people)	234'	35%
Factory supply		
- salaries (13 people)	169'	25%
- other costs	64'	10%
General Managments costs (2 people)	200'	30%
	667'	
Factory costs		
Salaries (143 people)	1,941'	34%
Consumables	200'	4%
Utilities	490'	9%
Factory supply (excl salary)	64'	1%
Materials	2,500'	44%
Royalty	317'	6%
Other costs (marketing & management)	160'	3%
	5,672'	

The costs and cash flow effects for the first 10 years based on the above listed costs and the estimated growth rates are presented in the table and the graphs in encl. 4.

The plant utilization is raised from about 50% the first year to about 90% in 1998 (one-shift situation). Additional equipment or product lines have to be decided latest in 1996.

Costs for re-investment = and/or for investment in capacity increase are scheduled from 1995.

Marketing costs		
Salaries and activities (24 people)	352'	53%
Royalties	317'	47%
	669'	
Administration, Legal & Medical affairs		
Salaries (18 people)	234'	35%
Factory supply		
- salaries (13 people)	169'	25%
- other costs	64'	10%
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The plant utilization is raised from about 50% the first year to about 90% in 1998 (one-shift situation). Additional equipment or product lines have to be decided latest in 1996.

Costs for re-investment = and/or for investment in capacity increase are scheduled from 1995.

X.1.5.2 An estimate of unit costs

The manufacturing costs excl. material costs but including factory supply costs calculated as average figures and assuming that the costs are shared between three production lines in proportion to this respective gross contribution figures are as follows with reference to the 1989 situation.

Total manufacturing costs incl. factory supply costs = 1,836' + 233'= 2,100' USD (1989).

	Total costs	Unit costs
Wet production	950'	
Ampoules 4" units	690'	0,2 dollar/unit
Bottles/vials 1" units	260'	0,3 " "
Dry production	700'	
Tablets 87" units	700'	8 dollar/1000
Antibiotics	450'	
Capsules 2" units	180'	0,1 dollar/unit
Vials/Bottles 1" units	270'	0,3 " "

These calculated unit costs are only indications as they may vary a lot depending on the real cost distribution and the capacity utilization of the different production lines.

How unit costs are changed in relation to capacity utilization is principally following the graph in encl. 18.
If for example the capacity utilization is increased from 50% to 90% within a one-shift the unit cost is reduced with almost 30%.

Notes to projected income statement for the fiscal years 1990-2000 (1000 USD =TUSD) "Most realistic case"

Line No: Assumptions:

110 Sales revenue

For 1989 = 7.920 TUSD

Based on the UNIDO report and the chosen product programme.

Growth rate 1989-1994 = 6 % p.a. (strategy 1)
Growth rate 1995-2000 = 10 % p.a. (strategy 1+2)
Start of sales from own production in September 1992 (1/3 of 1992)

120 Opening inventory = closing inventory previous year

130 Closing inventory = one month of the yearly sales value

199 Net sales revenue : (110) + (130) - (120)

211 Raw materials

For 1989 = 1.000 TUSD = 12,6 % of sales value based on the UNIDO report and the chosen product programme.
(199) x 12,6 %

212 Packaging materials

For 1989 = 1.500 TUSD = 19 % of sales based on estimations and the chosen product programme.
(199) x 19 %

213 Wages in production

Basic organization: 57 people.
Costs related to 1989 760 TUSD.
Growth rate 1989-1995 = 3 % p.a. Start T3 1992
Growth rate 1996 = 4 % p.a.
Growth rate 1997-2000 = 6 % p.a.

214 Consumables

Costs related to 1989 = 167 TUSD
Growth rate as for wages (213)

215 Utilities

Costs related to 1989 = 323 TUSD
Growth rate as for wages (213)

221 Salaries (QC,MA)

Basic organization : 29 people.
Costs related to 1989 = 329 TUSD
Growth rate 1989-2000 = 3 % p.a. Start T3 1992.

222 Consumables

Costs related to 1989 = 33 TUSD
Growth rates as for salaries (221).

223 Utilities

Costs related to 1989 = 167 TUSD
Growth rates as for salaries (221)

224 Technical assistance from Pharmadule and/or from Licensors.

1992 : 1/3 of 200 = 65 TUSD
(2/3 = 135 TUSD as preoperational costs

1993 : 250 TUSD
1994 : 250 TUSD
1995 : 250 TUSD
1996 : 250 TUSD
1997 : 250 TUSD
1998 : 250 TUSD
1999 : 250 TUSD
2000 : 250 TUSD

299 Total direct costs = (219) + (229)

399 Income less cost of products sold = (199) - (299)

411 Factory salaries

Basic organization : 13 people
Costs related to 1989 = 233 TUSD
Growth rate 1989 - 2000 = 3 % p.a. Start : T3 1992

412 Royalties

Net sales revenue (199) x 4 %

421 Marketing

Basic organization: 24 people.
Costs related to 1989 = 352 TUSD
Growth rate 1989 - 2000 = 3 % p.a. Start : T3 1992

422 Adminstration

Basic organization : 11 people.
Costs related to 1989 = 117 TUSD.
Growth rate 1989 - 2000 = 3 % p.a. Start : T3 1992

423 Legal affairs

Basic organization : 7 people.
Costs related to 1989 = 117 TUSD
Growth rate 1989- 2000 = 3 % p.a. Start : T3 1992

424 General management

Basic organization 2 - 3 people
Costs related to 1989 = 200 TUSD
Growth rate 1989 - 2000 = 3 % p.a.

499 Total indirect costs = (419) + (429)

599 Total direct and indirects costs = (299) + (499)

699 Net income (loss)

710 Interest long-term debt

11 % on 7400 TUSD
1991-1992 as prepoperational costs

711 Interest medium-term debt

15 % on 2300 TUSD
1991 - 1992 as preoperational costs

712 Depreciation

5 % on Civil Works and Buildings (2000)	= 100	TUSD
10 % on Local Equipment (1500)	= 150	"
5 % on Modules (Buildings) (2000)	= 100	"
10 % on Modules (Equipment) (5000)	= 500	"
10 % on Office Equipment (200)	= 20	"
25 % on Cars (300)	= 75	"
TOTAL	= 945	"

Starting 1993

713 Amortization

20 % on Preoperational costs (4278) = 856 TUSD

899 Net profit

(699) - (799)

999 Net profit after tax

= (899) No profit taxes are charged

Notes to projected balance sheet for fiscal years 1991-2000."Most realistic case".

120	Finished goods	One month of total direct and indirect costs
130	Accounts receivable	Two months of total direct and indirect costs
140	Raw material etc. Invent.	Six months of raw amterial costs and packaging material costs
250	Less: Acc. Amortization	20 % p.a. preoperational costs incl.establishing costs and interests
360	Less: Acc. depreciation	Depreciation of fixed assets 5 % p.a. on buildings 10 % p.a. on equipment 25 % on cars
510	Accounts payable	0 months of raw material costs packaging materials and royalties (L/C)

530	Current maturities	Annual repayments of long/medium term loans
630	Less: Acc. maturities	Acc.repayments of long/medium term loans
730	Acc.profits/ losses	From projected income statement line 1999

Notes to cash-flow projection: "Most realistic case"

110	Net income/loss	From income statement line 699
120	Less : Interest	On lon/medium term loans
130	Less : Increase Prod+RM+PM	Yearly increase of the value for finished goods, raw materials and packaging materials.Balance sheet line 120+140
140	Less: Increase accounts receivable	Yearly increase of the value of accounts receivable.From balance sheet line 130
150	Increase accounts payable	Yearly increase of the value of accounts payable.From balance sheet line 510
160	Less: Additional assets	Yearly preoperational and investment costs (*)
399	Change in cash	line 199+299
499	Acc.change in cash	Equal to line 110 in balance sheet
699	Discounted net cash flow	All payments discounted at 20 % discount rate to 1992 value
799	Accumulated discounted net cash flow	Adding up all discounted net cash flows

(*) Preoperational expenses

	1990	1991	1992	1993
Feasibility study	120	-	-	-
Project design	-	250	-	-
Project adm. and systems	-	350	135	-
Education	-	100	200	-
Installation	-	-	200	-
Test run costs	-	-	150	-
Export credits	-	-	-	-
Others	-	33	33	-
Wages in production (1/3 of 1992)	-	-	277	-
Salaries (QC + MA) (1/3 of 1992)	-	-	141	-
Factory supplies (1/3 of 1992)	-	-	85	-
Salaries marketing and administration (1/3 of 1992)	-	-	214	-
General management + key managers	-	100 1/	133 2/	-
	120	833	1568	-

1/ ½ 1991
2/ 2/3 1992

Civil Works	1990	1991	1992	1993
Land and Buildings	-	2500	1700	-
Vehicles	-	100	200	-
Others	-	-	500	-
	-	2600	2400	-

Modules	1990	1991	1992	1993
	-	2500	3700	800

Interest during constr.

Interest on totally 9 700 tUSD mid 1991-1992

Notes to projected income statement for the fiscal years 1980-2000 "Most pessimistic case".

120	Sales revenue	1992: 30 % lower than the realistic case but same increase ratios
213	Wages in production	1992: 15 % lower than the realistic case but the same increase ratios
214	Consumables	As for 213
215	Utilities	- " -
216	Salaries	- " -
223	Consumables	- " -
411	Factory supplies	- " -
429	Subtotal fixed indirect costs	Same as for the realistic case

Notes to projected income statement. Export business.

(Added to the "Most realistic case" yields "Most optimistic case")

110 Sales revenue

1994	10 % of sales for Cameroun
1995	20 % of " " "
1996	40 % of " " "
1997	80 % of " " "
1998	Equal to " " "
1999	" " " " "
2000	" " " " "

The size of the markets of UDEAC less Cameroun are appoximately os the size of the Camerounian market.

211	Raw materials	(199) x 12.6 %
212	Packaging materials	(199) x 19 %
213	Wages	(199) x 8 %
214	Consumables	(199) x 1.7 %
215	Utilities	(199) x 3.5 %
216	Salaries (OC+MA)	(199) x 3 %
217	Utilities	(199) x 1,7 %
399	Income less cost of products sold	(199) - (299)

411 Factory supplies (199) x 1,9 %

412 Royalties (199) x 4 %

421 Marketing (199) x 7 %

699 Net income (199) - (599)

712 Depreciation on investment in 1997

5 % on Civil Works & Buildings (=1000) = 50 TUSD
5 % on Modules (Building) (=1000) = 50 TUSD
10 % on Modules Equipment (=3000) = 300 TUSD

400 TUSD

160 Modules Investment for expansion 1997
= 5000 tUSD

Sensitivity analysis:

The three scenarios are illustrating the sensitivity of the project but to illustrate the sensitivity in a more practical sense the following sensitivity analysis is made:

Cost element (*)	% change	% profit impact
Relative prices	1	9,7
Sales volume	1	6,5
Other costs	1	3,6
RM+PM	1	3,0
Capital costs	1	2,2

(*) Most realistic case.1995

Impact for each percentage unit of devaluation

Impact on profitability(*)

Impact on selling prices = 0,4 % (1.) 0,4 x 9,7=4
Impact on sales volume = 0,2 % (2.) 0,2 x 6,5=1,3
Impact on import prices = 1 % (3.) 1,0 x 3,0=3,0
Impact on other costs = 0,6 % (4.) 0,6 x 3,6=2,1
Impact of capital costs = 0,5 % (5.) 0,5 x 2,2=1,1

Total impact on profitability : = 11,5 % (6.)

i.e. for every percentage of devaluation the profit decreases by c:a 12 %. At 8 % devaluation the profit is wiped out.

A 1 % devaluation will increase the payments of interests and loan repayments of foreign loans with 18,000 USD p.a.or 0,7 % of the total interests and payments.

NOTES:

(1.) We assume that the devaluation of 1 % can be compensated with price increases of only 0,6 %. The impact is thus 0,4 %.

(2.) We assume that the sales volume will decrease with 0,2 % for each percent as a result of the above assumed price compensation.

(3.) We assume that a devaluation of 1 % will increase import prices by approximately 1 % (valid in a restricted interval)

(4.) We assume that the devaluation of 1 % will increase the Other costs by 0,6 %.

(5.) The proportion (c:a 25 %) of the capital costs which are loans in foreign currency will be affected. The total impact will therefore be 0,25 %

(*) For evaluation of the impact on profitability we have used "The most realistic case" and year 1995 as outlined in Chapter 10 and Executive Summary.

With the profound impact on proftability that a devaluation will have, the devaluation discussion is referred to the "Risk analysis".

X.1.6.2 Outline to a Plan of Action for improved profitability,if necessary and/or to cushion negative variations in the project.

See Chapter I

Chapter XI

The project's effect on the national economy

XI.1 Savings in foreign exchange

XI.2 Utilization of local resources

XI.3 Job creation

XI.4 Transfer of appropriate technology

XI.5 Environmental impact

XI.6 Calculation of value added to the project

XI.7 Others

XI.1 Savings in foreign exchange

About 1/3 of the net sales revenues of APHAS is constituted of imported raw materials and packaçing materials.

This means that about 2/3 of the net sales revenues will be savings in foreign currency since the same products are today imported ready-made.

The annual savings will thus be from around 2 mill USD in 1992 to 12,8 mill USD in 2000.

During the course of the project and the operations there are however other outlays in foreing currency which will reduce the savings. For the "Most realistic case" the total gross savings 1991-2000 will be about 76 mill USD.

Gross savings:	76	76
(mUSD)		
Less:		
(mUSD)		
Imports of modules and equipment	7	
Royalties	4,6	
Training + Technical assistance	2,1	
Reinvestments in equipment	5,5	19,2
Net savings:		56,8

XI.2 Utilization of local resources

Local resources will be used for:

Formation of part of the equity

Part of the lending

Land

Site preparation, civil works and design and construction oflocally built buildings

Local utilities; water, electricity, telecommunications

Management, staff and labour for the operation of the plant

Export of products to UDEAC countries

In the longer run local resources may also be used for development of new products.

XI.3 Job creation

The APHAS company will employ 143 people from the beginning in an area which does not have many such facilities.

38 with university education
49 with vocational training background
55 basic education

Over the projected time in this study the total number of employees will increase with about 30 % to 186 people.

In the "Most optimistic case" the APHAS company will employ about the double number of people.

XI.4 Transfer of appropriate technology

The technology transferred in this project will be advanced pharmaceutical technology in the processing, the utiliities and quality control.

It will fulfill the highest requirement on GMP and GLP in order to fullfill the requirements of the licensors's.

XI.5 Environmental impact

The waste problems in a pharmaceutical plant of this type are rather limited and can be solved easily.

Ordinary sewage will be treated on the premises. Wastes during processing (raw materials) will be treated in the sewage plant.

Dust from inside the factory will be collected by separate dust-collection systems.

The emissions of solvents are negligible.

Solid waste (paper and cartons, glass bottles plastic containers and scrap plastic etc.)from the processes will be treated as customary and in accordance with local regulations.

XI.6 Calculation of value added to the project

Sales value during the period 1992-2000 =	114	mUSD
Less: Imported raw materials and packaging materials	38	mUSD
Less: Consumables and utilities	2	mUSD
Less: Royalties	4,6	mUSD
Less: Technical Assistance	2,1	mUSD
Value added:	67,3	mUSD

So the value added through the project is 68,4 mUSD or a factor 1,5 in relation to the inputs.

XI.7 Others

Will the creation of APHAS have an impact on health care in Cameroon ?

As we have pointed out some times before we think that APHAS can contribute a lot to an improved health care in Cameroon through its presence in the market and through activities visavi e.g. the the pharmacists the medical profession and the health authorities.

Such activities could result in :

- fewer and better preparations on the market resulting in safer and more efficient treatment of medical problems
- fewer and better preparations on the market facilitating the future growth of the market
- better informative standards on promotional material and other information to doctors and patients
- succesive elimination of companies from the market

Chapter XII

Risk factors in the project

XII.1 Delays and cost increases in the investment phase

XII.2 Market

XII.3 Capacity utilization

XII.4 Suppliers/Licensors

XII.5 Others

XII.5.1 War
XII.5.2 Revolution
XII.5.3 The banking system
XII.5.4 Lack of experienced staff
XII.5.6 Labour unrest, strikes
XII.5.7 Currency restrictions/Devaluation risks

XII.6 Possibilities to control and/or influence the risk factors

XII.1 Delays and cost increases in the investment phase

The investment consists of three main cost elements which are analyzed below:

1. The preoperational costs
2. The site preparation and civil works
3. The production modules

The preoperational costs may vary quite a lot because the project is still at an initial stage, and they may have a rather large impact on the profitability of the project because they are "early costs" which means that they have a relatively high weight in the net discounted value.

Remedies:

There are no other remedies than making a realistic budget and try to control it.

The site preparation and civil works constitute about half of the total investment.We have no historic information about the selected local contractor's cost or time compliance but our experience from other similar projects is that the local component has a tendency to escalate and/or extend for various reasons.

The fact that the selected contractor is a CFI-controlled company needs special attention.

Another factor that requires attention is that the information about the site is limited.We don't have access e.g. to geological data but only to "hearsay" that the site will offer no particular problems.

Cost for access road,water,electricity and sewage have been estimated only.

Remedies:

We strongly recommend an unified project management reporting directly to the project board for both the local construction and the manufacturing of the modules etc.in order to control the costs and the timing.

It would be advisable to hire a neutral project management consultant.

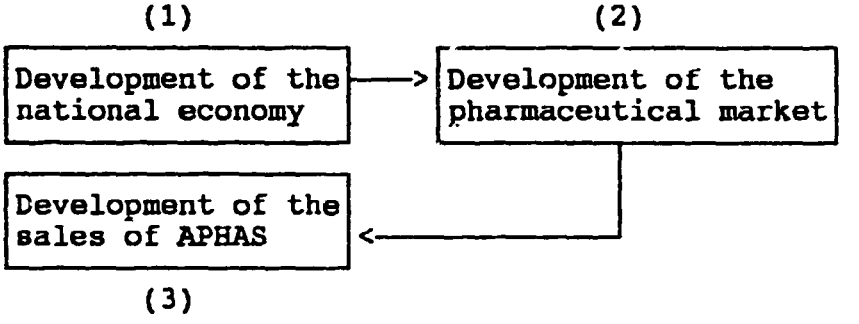
The construction of the modules.

As far as we understand the module part of the investment is offered on a fixed price basis which makes the risk for cost escalations here minimal.

Should there however be any delay in e.g. the financial arrangements then we assume that there will be a risk for cost escalations depending on the extent of delay. On the other hand such cost escalations should be catered for in the supply contract so that their size can be anticipated.

XII.2 Market

We have the follwoing logic to consider:



The relationship between (1) and (2) has at least face validity although the relationship in e.g. industrialized countries is far from clear.The development of pharma markets seem to be rather inert in relation to the general economic circumstances.

A factor that contributes to this is of course the availablility of various "social cushions" like health insurance schemes etc.

That kind of facilities are non-existing in Cameroon, at 1least in the institutionalized sense, so one can expect a more linear relationship between the development of the national economy and the pharma market.

It is only possible to guess how the national economy will develop in the next couple of years and consequently the pharma market.

But it is still quite possible to estimate the growth of APHAS.with some degree of certainty bearing in mind the following general heuristics:

1.It is difficult to increase market share when the market grows rapidly unless one already controls a large share of the market

2.In a market that grows moderately it is less difficult to increase market share

3.In a market that stagnates or decreases it is again difficult to increase market share

We have come to the conclusion that the Cameroonian pharma market may continue to grow between 0 - 6 % in real terms in the next couple of years and that it is quite possible for APHAS under those circumstances to grow by 6 % p.a.

We think that the risk that the market will decrease further is low.

Remedies:

It is of course not possible for a single company to influence the national economy, so we have to consider the national economical development, as a fact we cannot affect.

Also the growth of the pharma market is difficult to influence for a single company but being one of the few local manufacturing companies in a rather disorganized, fragmented market with too many companies and products on the market and also a considerable amount of products which are of questionable medical value APHAS has the possibility of turning all these factors to its advantage if it can be more visible active and professional in the marketplace and with leading ethical products in its product range but it should also be able to capture a large share of the market through interaction with the "macrostructure".

In the literature the relation in profit impact between "internal" and "external" interaction is often estimated to 1:3-5.

We think in fact that the "U.S.P." (Unique Selling Proposition) of APHAS may well be its ability to turn the conditions of the Cameroonian market to its advantage.

Since the development and growth of the market is such a key issue for the success of the market and since precise and reliable market information is not readily available we would strongly recommend that APHAS as soon as

possible allocates resources to market research.We think that the company thereby can create a considerable competitive edge for itself.

XII.3 Capacity utilization

In general we don't forsee any abnormal serious technical capacity utilization problems e.g. caused by an extended learning curve.

This is to a major part an effect of the usage of the Pharmadule concept.

Availability of skilled workers and impact of training programmes will be discussed elsewhere.

XII.4 Suppliers/Licensors

The key risk in the project, or the determining factor, is the negotiations with the licensors, because without enough license agreements, the whole project is in jeopardy.

According to C.F.I the attitude of the possible licensors is positive towards license agreements with CFI/APHAS although no formal agreements nor "letters of intent" have been entered into.

The main difficulty in the discussions with the licensors had been to convince them that APHAS could establish a pharmaceutical factory conforming with international GMP-requirements.

After the introduction of Pharmadule and its turn-key modular system of building pharmaceutical plants into the project,this difficulty should have been eliminated.

The next check-point for the investors, and for the licensors as well of course, will be the results and recommendations of this feasibility study.

So the license negotiations cannot really take place before the feasibility study is ready and the feasibility study will then have to be based on assumptions about the outcome of the license negotiations ...

In order to avoid a series of similar ""Catch 22" situations and in order to avoid postponement of a final investment decision we suggest the following:

Remedies:

1.Allocate enough resources quantitatively and qualitatively to finalize the license negotiations without delay.

2.Start with those licensors who can be expected to be the easiest to arrange a deal with.

3.Conduct the negotiations along two alternative lines:

3.1 Settle for a final license agreement with conditions if necessary e.g.that the plant actually fulfills the GMP-requirements etc.

3.2 Settle for a "Letter of Intent" to be substituted for a license agreement, later on, if and when...

This alternative has the advantage that APHAS rather quickly can make a rather good prognosis for the likely outcome of the negotiations

We would suggest that at least 50 % of the projected sales should be covered by agreements of either 3.1 or 3.2 type with reservations for the risk propensity of the investors.

As far as concerns the suppliers they will in the majority of cases be same as the licensors as long as APHAS makes only license products, which will be for a considerable period, and therefore the main part of the supplies will have to be imported from or via the licensors.

Therefore we consider the risk of supply disruption due to problems at the supplier end as minimal.

XII.5 Others

XII.5.1 War

There is no likelihood of war in the region at present. Furthermore Cameroon and its neighbors have been living in peace since independence and Cameroon has natural borders to all its neighbors except one.Most of the neighbors are also members of UDEAC which is a stabilizing factor.

XII.5.2 Revolution

There are some elements in Cameroon which point in the direction that, if not revolution, social unrest and even the overthrow of the present management should not be outruled.

Such elements are e.g. the present economical crisis which is serious and is likely to stir up social and political unrest and possibly also dramatic changes on the management level.

Another element is the demand for a multiparty system which so far has been rejected by the present management.

If the present economic crisis continues the risk for a social upheaval may become manifest and even acute.

Should this happen it it however not necessary that a change in management is going to be violent.It may well be a "coup d'état".

Much depends of course also on how the present management tackles the crisis and the effects of the crisis.

Remedies:

It is of course not possible at the company level to do very much about this issue.It is a question of "riding with the tide"

We don't think that a possible change in political management will affect the APHAS venture very much and not necessarily in a negative way.

Furthermore C.F.I has won its position by business professionalism rather than by political connections and this will of course be a strength in the event of an acute political crisis.

XII.5.3 The banking system

XII.5.4 Lack of experienced staff

There are two factors here that concerns us:

1.On all organizational levels the availability of people with background in industrial pharmacy is very limited in Cameroon.

2. The geographical location of the site.

C.F.I. maintains that in general the educational level in Cameroon is high and there should be no problem, to find e.g. engineers to be trained even in the area of Likomba.

As far as company management is concerned C.F.I. has already started the "spotting" of candidates and says that if enough experienced people cannot be found in Camercon they can most certainly be found in France.

As far as concerns skilled semiskilled or unskilled labour the availability is abundant and the motivation and willingness to undergo extensive training is probably great so this might not be a problem.

As far as the geographical location is concerned C.F.I. reassures us that migration to the area of the site or commuting should not be a problem.

In spite of all the reassurances given by C.F.I we still feel concerned about the staffing question:

We will be starting from scratch with very few people with experience from pharmaceutical industry.

On the other hand C.F.I. has done similar projects before with very good results.

We think, however, that this point needs further elaboration before confronting the licensors.

Remedies:

1.Staff training will be of paramount importance i.e. training abroad for management and supervisors.Training on spot for workers.

2.Expatriate support on key functions during the first 2 - 3 years of operation

XII.5.6 Labour unrest, strikes

Apart from what has been covered under XII.5.2 above we have no evidence that labour unrest should play a significant part in the life of the company.It seems that the C.F.I experience is the contrary; that the workforce is stable and loyal.

XII.5.7 Currency restrictions/Devaluation risks

Since the convertibilty of the CFFA is guaranteed by the Banque de France it should not be expected that there should be any restrictions imposed on the availability of foreign currency .

With the regression of the economy, however, one could expect sooner or later some measures to be taken, in order to restrict the outflow of foreign currency.In fact this has already taken place in a way through the increased bureaucracy in relation to payments abroad which has caused a delay of about one month on payments already.

This is not the place for speculation about what will happen but we would recommend that attention is paid to the development in this field.

Another type of quite different currency restriction is the reduced money supply which leads to reduced liqudity in e.g. the banks which will cause delays in payments generally.

Remedies:

There is not much a single company can do to alleviate or circumvent currency restrictions but to be alert and try to adjust the payment conditions accordingly.Suppliers may counteract by demanding L/C:s to a greater extent which will probably delay payments further.

One could speculate perhaps, that the purpose of the project will lead to a diminished outflow of currency later on, and therefore could be put in some kind of priority now.

Currency restrictions usually hit blindly and without individual considerations and furthermore the argument above is probably not considered valid in the short-term perspective by the financial authorities.

Impact for each percentage unit of devaluation

Impact on profitability(*)

Impact on selling prices	=	0,4 % (1.)	0,4 x 9,7=4
Impact on sales volume	=	0,2 % (2.)	0,2 x 6,5=1,3
Impact on import prices	=	1 % (3.)	1,0 x 3,0=3,0
Impact on other costs	=	0,6 % (4.)	0,6 x 3,6=2,1
Impact of capital costs	=	0,5 % (5.)	0,5 x 2,2=1,1
Total impact on profitability :	=	11,5 % (6.)	

i.e. for every percentage of devaluation the profit decreases by c:a 12 %. At 8 % devaluation the profit is wiped out.

A 1 % devaluation will increase the payments of interests and loan repayments of foreign loans with 18,000 USD p.a. or 0,7 % of the total interests and payments.
NOTES:

(1.) We assume that the devaluation of 1 % can be compensated with price increases of only 0,6 %. The impact is thus 0,4 %.

(2.) We assume that the sales volume will decrease with 0,2 % for each percent as a result of the above assumed price compensation.

(3.) We assume that a devaluation of 1 % will increase import prices by approximately 1 % (valid in a restricted interval)

(4.) We assume that the devaluation of 1 % will increase the Other costs by 0,6 %.

(5.) The proportion (c:a 25 %) of the capital costs which are loans in foreign currency will be affected. The total impact will therefore be 0,25 %

(*) For evaluation of the impact on profitability we have used "The most realistic case" and year 1995 as outlined in Chapter 10 and Executive Summary.

XII.6 Possibilities to control and/or influence the risk factors

We have discussed under each paragraph the possibilities to control and/or influence the risk factors and that discussion need not be repeated here.

We think that the following risk factors have a rather low probability and that they therefore are negligible:

* War
* Labour unrest/strikes

We think that the following risk factors can be controlled or planned and acted upon:

* Delays and cost increases in the investment phase
* Capacity utilization
* Suppliers/Licensors

* Lack of experienced staff

Whereas the following risk factors need constant surveillance and preparedness:

* **The development of the market**
* Risk for social and political unrest
* The banking system
* Currency restrictions

Of these risk factors

* **Suppliers/Licensors**
* **The development of the market**

are the **KEY ISSUES** to the success of the project and needs special attention and action.

In this we would just like to propose that everybody concerned tries to think sharply <u>beyond</u> the risks that we have identified

The various growth strategies. 1000 USD. 1989 prices.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10	(11)	(12)	(13)		(14)	(15)
89	7.920	7.920	0	0	7.920	7.920	0	0	7.920		7.920		0		7.920	0
90	8.395	8.712	0	0	8.395	8.712	0	0	8.395	6	8.712	10	0		8.395	6
91	8.899	9.583	0	0	8.899	9.583	0	0	8.899	6	9.583	10	0		8.899	6
92	9.433	10.542	0	0	9.433	10.542	0	0	9.433	6	10.542	10	0		9.433	6
93	9.999	11.596	0	0	9.999	11.596	0	0	9.999	6	11.596	10	0		9.999	6
94	10.599	12.755	0	0	10.599	12.755	0	0	10.599	6	12.755	10	1.059		11.658	17
95	11.235	14.031	424	765	11.659	14.796	0	0	11.659	10	14.796	16	2.330	120	13.989	20
96	11.909	15.434	917	1.734	12.826	17.168	0	0	12.826	10	17.168	16	5.130	120	17.956	28
97	12.623	16.977	1.487	2.948	14.110	19.925	357	772	14.468	13	20.697	21	11.288	120	25.398	41
98	13.381	18.675	2.144	4.456	15.525	23.131	769	1.740	16.294	13	24.871	20	15.525	38	31.050	22
99	14.184	20.542	2.899	6.316	17.082	26.859	1.241	2.944	18.323	12	29.802	20	17.082	10	34.164	10
0	15.035	22.597	3.763	8.597	18.798	31.194	1.780	4.427	20.578	12	35.621	20	18.798	10	37.596	10

Comments:
(1) Growth Strategy No 1 = 6 % p.a.
(2) Growth strategy No 1 = 10 % p.a.
(3) Growth strategy No 2 = + 4 % p.a.
(4) Growth strategy No 2 = + 6 % p.a.
(5) = (1) + (3)
(6) = (2) + (4)
(7) Growth Strategy No 4 = + 3 % p.a.
(8) Growth Strategy No 4 = + 5 % p.a.
(9) = (5) + (7)
(10) % change p.a.
(11) = (6) + (8)
(12) % change p.a.
(13) Growth Strategy No 3 = Export
(14) = (5) + (13)
(15) % change p.a.

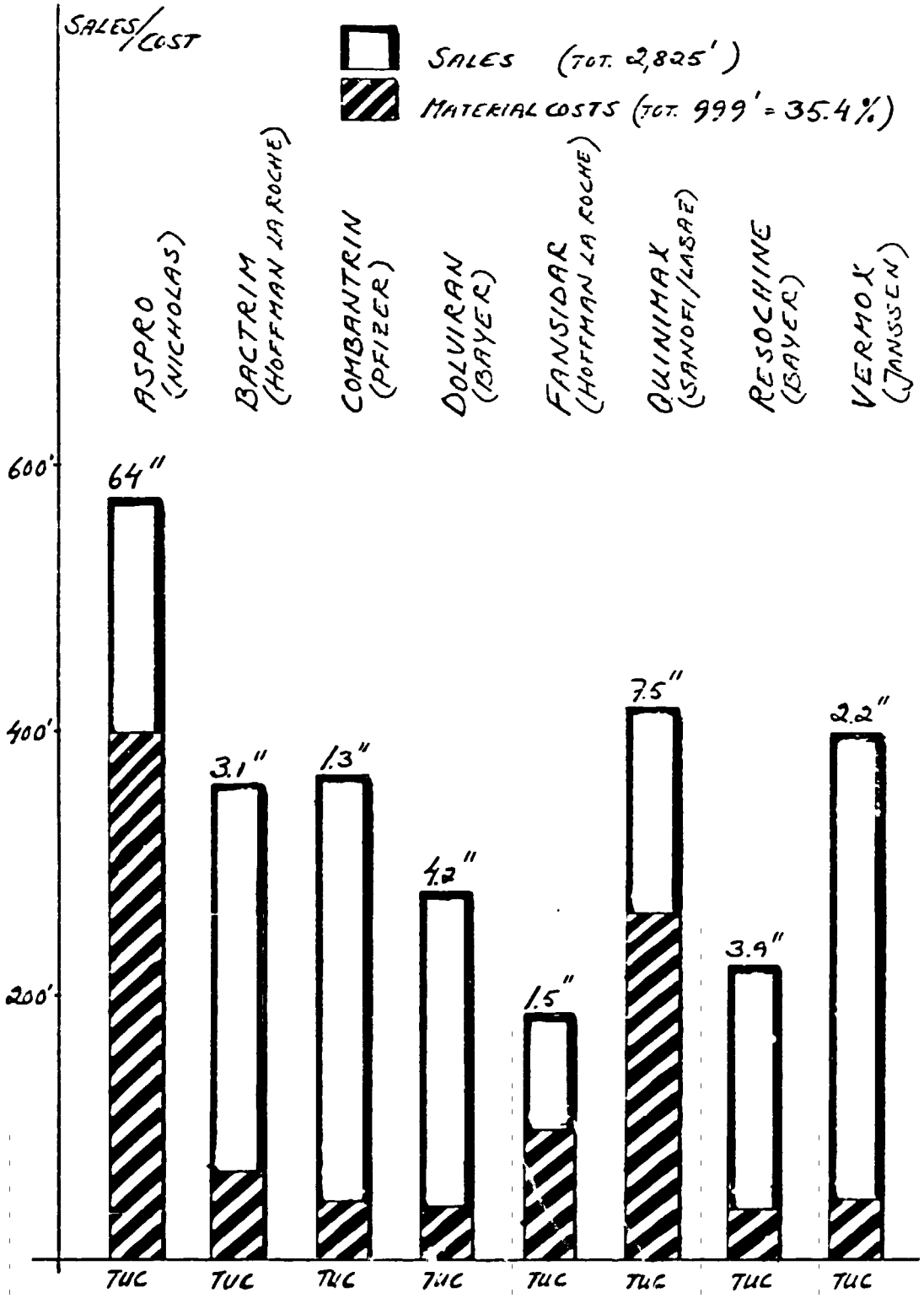
ENCL. 1

The Production Line for "Dry" Products

Name	DFO	Strength	Sales unit	L cost	No of sales units	Sales	Prod No of units	RM costs	PM costs	Gross contri-bution	%
Aspro	TUC	320 mg	3x10	0.47	120'	56,3'	3,780'	4.9'			
Aspro	TUC	320 mg	3x20	0.64	143.2'	92,3'	9,022'	11.7'	316.7'	177'	31
Aspro	TUC	320 mg	6x20	1.11	76'	84,1'	9,576'	12.4'			
Aspro	TUC	320 mg	9x20	1.59	216.2'	343,1'	40,866'	53.1'			
Bactrin AD	TUC	400/80mg	2x10	1.92	99.8'	191,1'	2,095'	23.0'			
Bactrin CH	TUC	100/20mg	2x10	0.68	16.2'	11,0'	340'	1.0'	26.5'	293.4'	81
Bactrin Forte	TUC	800/160mg	x10	2.21	71.7'	158,4'	753'	16.6'			
Combantrin	TUC	125 mg	x6	1.34	128.1'	172,1'	807'	8.9'			
Combantrin	TUC	250 mg	x3	1.36	145'	196,6'	457'	10.0'	25.3'	324.5'	88
Dolviran	TUC	400 mg	x20	1.43	199.1'	284,9'	4,181'	6.7'	34.8'	243.4'	85
Fansidar	TUC	500 mg	3x1	0.39	485.9'	189,2'	1,531'	61.2'	38.3'	89.7'	47
Quinimax	TUC	100 mg	x30	1.75	239.2'	419,4'	7,534'	226.0'	37.7'	155.7'	37
Resochine	TUC	100 mg	3x10	1.83	122.9'	224,5'	3,870'	19.4'	19.3'	185.8'	83
Vermox	TUC	100 mg	x6	1.07	240.7'	258,1'	1,517'	5.3'			
Vermox	TUC	100 mg	8x5x6	36.58	2.4'	88,5'	610'	2.1'	36.7'	356.3'	88
Vermox	TUC	500 mg	x2	1.67	32.9'	54,9'	69'	1.1'			
TOTAL						2,824.5'		463.4'	535.3'	1,825.8'	65

87" Tablets

'DRY' MANUFACTURING UNIT

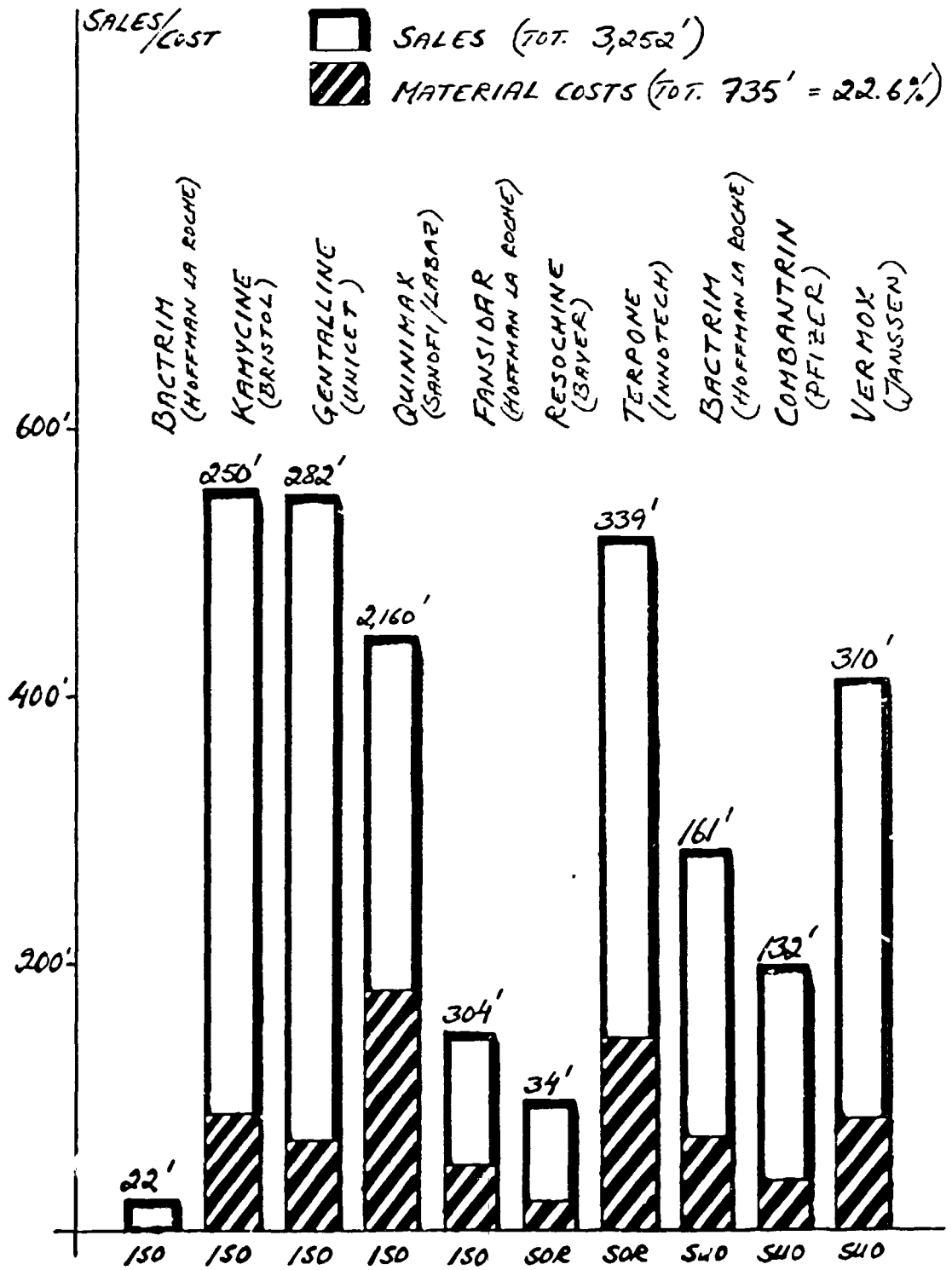


The Production Line for "Wet" Products

Name	DFO	Strength	Sales unit	L cost	No of sales units	Sales	Prod No of units	PM costs	PM costs	Gross contri-bution	%
Bactrin	ISO	3 ml	x6	7.01	3.3'	23.1'	22'	0.6'	2'	20.5'	88
Kanycine	ISO	1g/4 ml	x1	1.46	50.6'	73.6'	56'	5'	11.2'	57.4'	78
Kanycine	ISO	2g/7 ml	x1	2.75	176.1'	484.1'	194'	33'	38.8'	412.3'	85
Gentalline	ISO	10mg/1ml	x1	0.47	21.0'	10.0'	23'	0.2'	3.8'	6'	60
Gentalline	ISO	40mg/2ml	x1	1.00	44.0'	43.9'	48'	1.2'	8'	34.7'	79
Gentalline	ISO	80mg/2ml	x1	1.62	51.5'	83.2'	57'	3'	9.5'	70.7'	85
Gentalline	ISO	160mg/2ml	x1	2.97	140.2'	415.7'	154'	16'	25.7'	379'	91
Quinimax	ISO	100mg/1ml	x6	0.93	6.2'	5.8'	41'	0.1'	3.1'	2.6'	44
Quinimax	ISO	100mg/1ml	x50	4.48	4.3'	19.4'	238'	0.7	17.9'	0.8'	4
Quinimax	ISO	200mg/2ml	x6	1.21	32.8'	39.5'	216'	1.3'	16.2'	22'	55
Quinimax	ISO	200mg/2ml	x50	6.50	4.9'	31.6'	267'	1.6'	20'	10'	31
Quinimax	ISO	400mg/4ml	x6	2.07	111.8'	231.3'	738'	8.9'	55.4'	167'	72
Quinimax	ISO	400mg/4ml	x50	9.89	12.0'	118.7'	660'	8.0'	49.5'	61.2'	51
Fansidar	ISO	2 ml	x2	1.09	138.0'	150.2'	304'	12.1'	38'	100.1'	66
Resochine	SOR	50mg/5ml	75 ml	3.07	32.4'	99.2'	34'	14'	9'	76.2'	76
Terpone	SOR	5 ml	200 ml	1.61	322.8'	520.1'	339'	41'	85'	394.1'	75
Bactrin	SUO	100mg/5ml	100 ml	1.88	153.1'	287.7'	161'	18'	54'	215.7'	75
Combantrin	SUO	50mg/5ml	15 ml	1.59	126.0'	200.7'	132'	9'	29'	162.7'	81
Vermox	SUO	100mg/5ml	30 ml	1.41	294.8'	414.4'	310'	7'	78'	329.4'	79
TOTAL						3,252.2'		180.7'	554.1'	2,517.4'	77

3.1" + 0.8" ampoules 1-7 ml + 10 ml
375' bottles 75-200 ml
600' vials 15-100 ml

"WET" MANUFACTURING UNIT

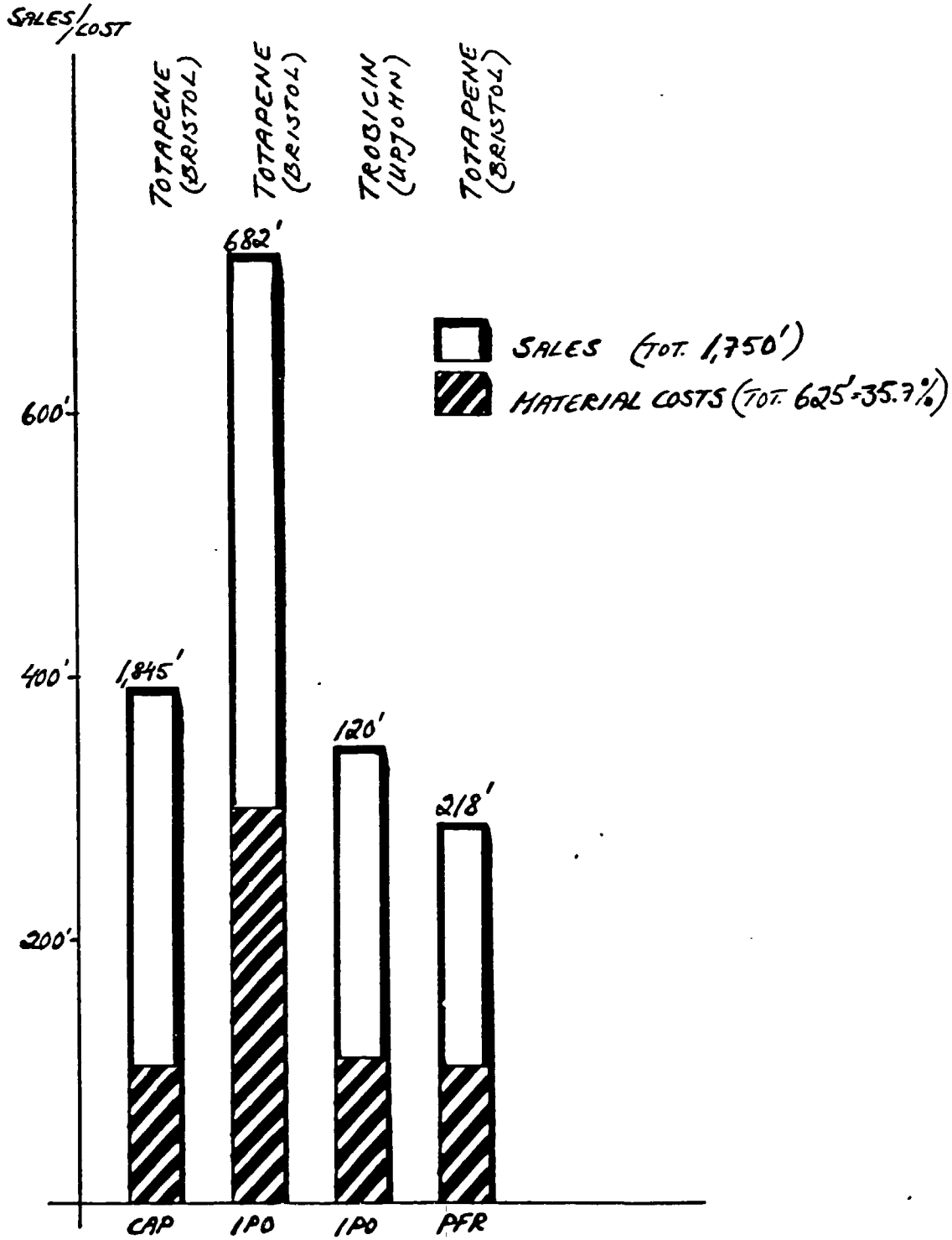


The Production Lines for "Antibiotics"

Name	DFO	Strength	Sales unit	L cost	No of sales units	Sales	Prod No of units	PM costs	PM costs	Gross contri-bution	%
Totapene	CAP	500 mg	x12	2.69	146.4'	393.7'	1,845'	74'	31'	288.7'	73
Totapene	IPO	0,5 g	x1+1	0.76	65.8'	50.1'	69'	4'	23'	23.1'	46
Totapene	IPO	1,0 g	x1+1	1.13	410.1'	462.2'	431'	50'	144'	268.2'	58
Totapene	IPO	1,0 g	x20+20	24.31	8.6'	210.3'	182'	21'	61'	128.3	61
Trobicin	IPO	2,0 g	x1+1	3.03	114.4'	346.2'	120'	72'	40'	234.2'	67
Totapene	PFR	125mg/5ml	60 ml	1.01	103.8'	104.3'	109'	15'	27'	62.3'	59
Totapene	PFR	250mg/5ml	60 ml	1.58	91.7'	144.9'	96'	27'	24'	93.9'	65
Totapene	PFR	500mg/5ml	60 ml	2.98	12.7'	37.8'	13'	8'	4'	25.8'	68
TOTAL						1,749.5'		271'	354'	1,124.5'	64

1.85" capsules
0.8" vials 10 ml
(0.8" ampoules 10 ml)
0.25" bottles 60 ml

"ANTIBIOTIC" MANUFACTURING UNIT



Manufacturing Cost Structure Corresponding to the Combined Growth Strategy Column No 5 (x 1000 USD)

	RM+PM	Prod costs	Quality control costs	Materials adm costs	Tot manuf costs	Gross profit %	Royalty 4%	Marketing costs	Adm cost	Preop. techn assist costs	Tot. factory costs	Profit before finan. costs %
	1	2	3	4	5	6	7	8	9	10	11	12
(1989	2,500	1,250	217	369	4,336	45.3	317	352	667		5,672	28.4)
1990												
1991										833	833	
1992	933	455	79	135	1,602	49.0	126	128	243	1,533	3,632	
1993	3,156	1,407	244	415	5,222	47.8	400	396	751	150	6,919	30.8
1994	3,346	1,449	252	427	5,475	48.3	424	408	774	150	7,231	31.8
1995	3,680	1,493	259	440	5,873	49.6	466	420	797		7,556	35.2
1996	4,048	1,552	267	453	6,321	50.7	513	433	820		8,087	36.9
1997	4,453	1,645	275	467	6,840	51.5	564	446	847		8,697	38.4
1998	4,898	1,744	283	481	7,406	52.9	621	459	871		9,357	39.7
1999	5,388	1,849	292	496	8,025	53.0	683	473	898		10,079	41.0
2000	5,927	1,960	300	510	8,698	53.7	751	487	923		10,859	42.2
2001	6,520	2,077	309	525	9,434	54.4	826	502	951		11,713	43.4

1. 1989-1994 Growth 6% p.a. 1995-2001 Growth 10% p.a.
2. 1989-1995 " 3% p.a. 1996 " 4% p.a. 1997-2001 Growth 6% p.a.
3-4. 1989-2001 " 3% p.a.
5. Summary 1-4
8. 1989-2001 Growth 3% p.a.
9. 1989-2001 " 3% p.a.
11. Summary 5+(7-10)

Packaging Material "Price List"

Item	Cost USD
Vials/ampoules 2 ml	30-35 D/1000
- " - 10 ml	75 D/1000
Rubber stoppers	30-35 D/1000
Aluminium closures	9 D/1000
Ampoule Label	25-30 D/1000
Plastic trays (for ampoules)	30-35 D/1000
Cartons	80 D/1000

Examples req. packaging material costs

1.	Labelled 10 ml ampoule	0.1 D/unit
2.	A sales unit of 20 x 10 ml ampoules	2.1 D/unit
3.	Labelled 2 ml ampoule	0.05 D/unit
4.	A sales unit of 20 x 2 ml ampoules	1.3 D/unit
5.	A sales unit of x 20 tablets in blisters	0.1-0.15 D/unit

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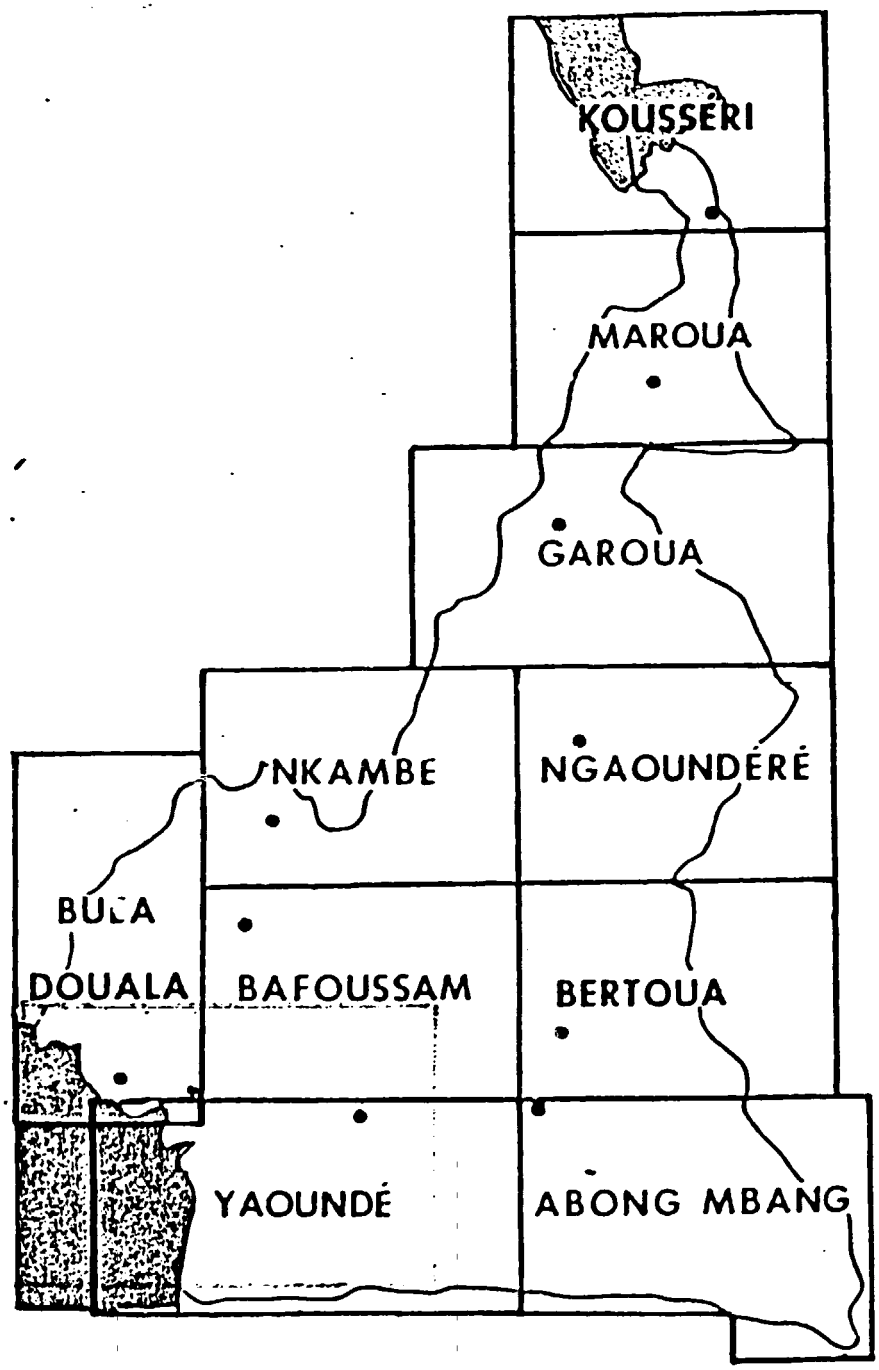
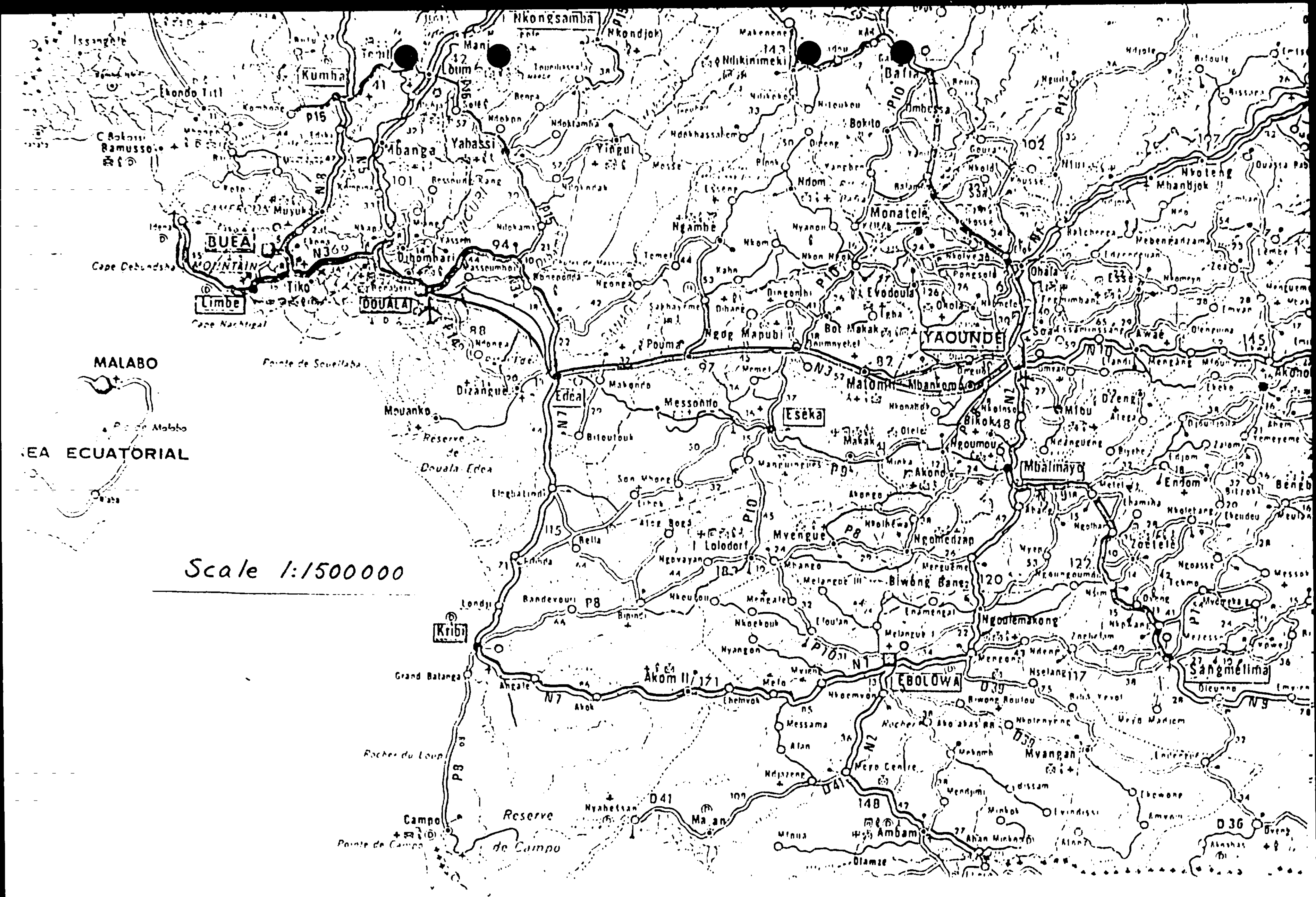
ENCL. 7



Pour une connaissance plus détaillée du Cameroun utilisez la carte à 1/500000 en 10 feuilles édition pliée ou à plat

For more detailed knowlege of Cameroon use the 10 sheet maps on the scale 1/500000 folded or unfolded edition



Nkongsamba
Kumba
Ekondo Titi
Bamusso
Mbanga
Yabassi
Yingui
Ndikinimeki
Bafia
Bokito
Ombessa
Ndom
Monatele
Ngambe
BUEA
Limbe
Tiko
DOUALA
Dibombari
Cape Debundsha
Cape Nachtigal
MALABO
EA ECUATORIAL
Pointe de Souellaba
Dizangue
Mouanko
Reserve de Douala Edea
Edea
Pouma
Ngog Mapubi
Messondo
Eseka
Evodoula
Obala
YAOUNDE
Soa
Awae
Akonolinga
Matomb
Mbankomo
Bikok
Ngoumou
Makak
Akono
Mbalmayo
Dzeng
Mfou
Endom
Bengbis
Zoetele
Lolodorf
Mvengue
Ngomedzap
Biwong Bane
Kribi
Bipindi
Ngoulemakong
EBOLOWA
Sangmelima
Akom II
Grand Batanga
Campo
Reserve de Campo
Pointe de Campo
Rocher du Loup
Nyabessan
Ma'an
Ambam
Meyo Centre
Mvangan
Olamze
N7
N3
N2
N1
N10
N369
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P8
P3
D41
D39
D36
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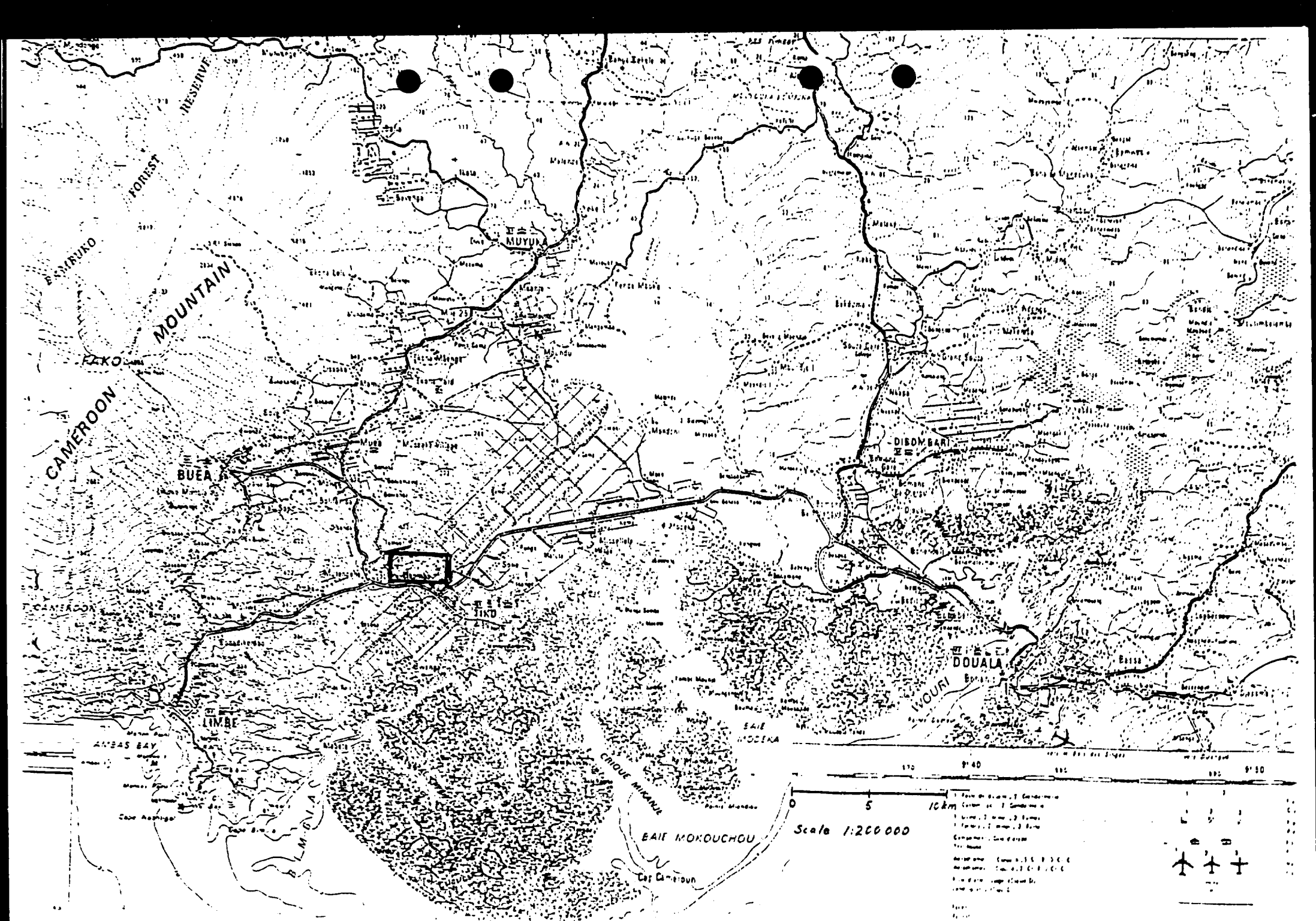

RESERVE
FOREST
MOUNTAIN
CAMEROON
FAKO
MUYUKA
BUEA
TIKO
LIMBE
DIBOMBARI
DOUALA
CAMEROON
ANIBAS BAY
CRIQUE MIKANJE
EAIE MOKOUCHOU
Cap Cameroun
EAIE
Scale 1:200 000
0
5
10km

I. POPULATION DU CAMEROUN

I.1. REPARTITION SELON LE SEXE ET L'AGE

L'estimation officielle de la population totale du Cameroun au 1er juillet 1987 et à l'an 1990 a été faite par l'unité de planification de la population de la Direction de la statistique et de la comptabilité nationale (Ministère du Plan). Cette estimation donne un effectif totale de 11.899.607 répartie ainsi qu'il suit par sexe et par groupe d'âge.

GROUPES D'AGE	LES DEUX SEXES		SEXE MASCULIN		SEXE FEMININ	
ANNEE 1990	EFFECTIF	%	EFFECTIF	%	EFFECTIF	%
0 - 4	2.195.470	18,4	1.101.030	18,5	1.094.440	18,4
5 - 14	3.291.057	27,7	1.638.106	27,7	1.642.951	27,6
15 - 59	5.749.353	48,3	2.884.688	48,6	2.864.665	48,1
60 et +	663.727	5,6	310.110	5,2	353.617	5,9
TOTAL	11.899.607	100,0	5.943.934	100,0	5.955.673	100,0

I.2. REPARTITION SELON LA RELIGION

Le Cameroun est un état laïc avec comme principales religions:

- la religion catholique : 32% de la population soit: 3.807.874.
- la religion protestante : 20% de la population soit: 2.379.921.
- la religion musulmane : 20% de la population soit: 2.379.921.
- autres(adventistes,animistes,sectes): 28% de la population soit: 3.331.889.

I.3. STRUCTURE SOCIO-ECONOMIQUE DE LA POPULATION

Le tableau ci-dessus reprend la structure de la population dans son ensemble dont:

- 18,4% des enfants
- 27,7% de la population d'âge scolaire
- 48,3% de la population d'âge actif et
- 5,6% de la population du troisième âge.

S'agissant de la répartition de la population d'âge actif par secteur socio-professionnel, les données disponibles datent de 1986/87 et donnent un effectif de 4.191.885 personnes occupées sur 4.224.390. Ces personnes occupées se ventilent de la manière suivante:

* secteur primaire : 3.325.346 personnes soit 76,9% de la population occupée.
* secteur secondaire : 282.654 personnes soit 6,7% de la population occupée.
* secteur tertiaire : 581.935 personnes soit 13,8% de la population occupée.

Une enquête du Ministère du travail relevait que sur 100 salariés, 95 sont de sexe masculin. Les statistiques officielles brutes en matière d'emploi (datant de 1986/87) font état de 551.500 salariés tant dans le secteur public (176.400 salariés) que dans le secteur privé et parapublic (375.100 salariés). Cette incohérence des statistiques ne nous permet pas de dresser une structure socio-économique vraisemblable de la population.

I.4. NIVEAU D'EDUCATION - TAUX D'ALPHABETISATION

Les statistiques de l'année 1986/87 nous donnent une population d'âge scolaire estimée à 2.902.847. Au cours de la même année 1.879.217 enfants étaient inscrits dans un établissement maternel et primaire, ce qui fait un taux de scolarisation de 65%.
Mais l'effectif global des élèves et étudiants pour l'année 1986/87 était de 2.294.653 non compris les inscrits dans les écoles de formation professionnelle.

I.5. MORBIDITE

Taux brut de natalité pour 1000 habitants en 1987 : 45%
Taux brut de mortalité pour 1000 habitants en 1987: 13%.

II. CONDITIONS CLIMATIQUES

Quatre grandes zones climatiques:

II.1. La zone forestière qui comprend le centre, le sud et l'est jusqu'aux contreforts sud de l'Adamaoua est régie par le climat sub-équatorial à quatre saisons: deux saisons sèches et deux saisons des pluies.

* Grande saison sèche (mi-novembre à mi-mars)
* Petite saison des pluies (mi-mars à mi-juin)
* Petite saison sèche (fin juin à mi-août)
* Grande saison des pluies (mi-août à mi-novembre).

La température moyenne est d'environ 22 °c.

II.2. La zone montagneuse de l'ouest connaît un climat dit "camerounien" très humide avec un nombre de jours de pluies par an avoisinant 250.
La saison sèche très courte va de mi-novembre à mi-février tandis que la saison des pluies longue va de mars à mi-novembre.
Le climat s'apparente à celui de la plaine littorale, car d'après les statistiques de la Direction de la météorologie, Douala a connu 200 jours de pluies pour une hauteur de précipitations de 3158 mm en 1987. Les températures moyennes varient de 31°c (maximo) à 24°c (minimo).

A Dschang par ailleurs, elles sont respectivement de 27 et 16°c pour 157 jours de pluies et 1779 mm de précipitations.

A l'ouest décembre est le mois le plus sec tandis que juillet-août et septembre sont les mois les plus humides.
La moyenne des températures est de 26°c.

II.3. L'Adamaoua c'est le climat tropical de transition à deux saisons:
Une saison sèche de novembre à mars et une saison des pluies d'avril à octobre. Les températures extrêmes sont de 15°c et 30°c. Décembre est le mois le plus chaud tandis que juillet-août et septembre sont les mois les plus humides. Ngaoundéré a connu en 1987 128 jours de précipitations pour 1391 mm de pluies.

II.4. Au Nord et l'Extrême nord c'est le climat tropical avec une saison sèche d'octobre à mai (Mars -avril et mai sont les mois les plus chauds) et une saison des pluies de juin à septembre; août étant le mois le plus humide. On y connaît d'importantes variations thermiques pouvant aller de 12° en décembre à 44° en avril.
Maroua et Garoua ont connu en 1987 une moyenne des précipitations de 650 mm d'eau pendant 40 jours de pluies.

III. ETAT DES COMMUNICATIONS - TELECOMMUNICATIONS

A. COMMUNICATIONS

A.1. RESEAU ROUTIER

Au 30 juin 1987, le réseau routier compte 65.718 km de routes comprenant le réseau classé et le réseau non classé.
Le réseau classé long de 34.718 km comprend les routes bitumées (2.930 km) et les routes non bitumées en terre (31.788 km); ces routes (dont la longueur sera sensiblement différente avec les projets achevés ou en voie de l'être) dépendent directement du Ministère des Travaux Publics et des Transports.
Par contre le réseau non classé long de 31.000 km, relève de la compétence des organismes de développement et des municipalités qui en assurent la création et l'entretien.

A.2. RESEAU FERROVIAIRE

Longueur : 1114 km pour 55 gares y compris les voies de services. Il comprend deux lignes à voie unique.

- ligne de l'ouest (Douala-Nkongsamba avec embranchement Mbanga-Kumba) (29km) de conception très ancienne s'étire sur 172 km.
- la ligne transcamerounaise (Douala-ngaoundéré) longue de 884 km et de conception plus moderne comprend deux sections:
  * Transcam I Douala-Yaoundé (262 km) avec embranchement Ngoumou-Mbalmayo (30km).
  * Transcam II Yaoundé-Ngaoundéré (622 km).

A.3. COUT DU TRANSPORT PAR ROUTE ET PAR RAIL(voir annexe)

A.4. PORTS ET AEROPORTS

A.4.1. PORTS

PORT DE DOUALA

L'ensemble Douala-Bonébéri est le port le plus important du pays et draîne à lui tout seul l'essentiel du transport maritime; en 1987 le trafic à regressé de 12,6% pour atteindre 3.696.000 tonnes contre 4.228.000 tonnes en 1986. Le trafic du port de Douala est représenté par le tableau ci-après:

EVOLUTION DU TRAFIC DU PORT DE DOUALA

RUBRIQUES	UNITE	1983	1984	1985	1986	1987
NOMBRES DE NAVIRES	nombre	3.398	3.370	3.319	2.707	2.590
dont: - Cargos	"	690	657	690	713	597
- Autres	"	2.708	2.713	2.829	1.994	1.993
JAUGE NETTE TOTALE	10^3 Tx	6.061	5.865	6.362	6.427	6.059
MARCHANDISES[3]	"	3.752	4.013	4.438	4.228	3.696
dont: - débarquées	"	2.862	3.013	3.428	3.188	2.713
- embarquées	"	889	1.000	1.010	1.040	983
PASSAGERS	nombre	2	41	280	1.195	690
- débarqués	"	2	11	149	861	571
- embarqués	"	-	30	131	382	119

Source: Office nationale des Ports du Cameroun (ONPC).

Le port de Douala /Bonabéri a accueilli 2590 navires en 1987, contre 2707 en 1986, soit une diminution de 117 navires (-4,3%) due à la baisse du nombre de cargos (-116 navires).
La diminution du nombre de cargos amarés à Douala/Bonabéri porte la jauge nette à 6.059.000 tonneaux contre 6.427.000 tonneaux en 1986, soit une regression de 5,7% (-368.000 tonneaux).

PORT DE KRIBI-CAMPO

Le tableau subséquent retrace l'évolution du trafic de ce port d'importance secondaire par rapport à Douala.

DESIGNATION	UNITE	1983	1984	1985	1986	1987
IMPORTATIONS						
- farine	tonne	2600	2250	1100	1425	2000
- sel	"	1400	530	-	-	-
- fer et tôles	"	-	467	74	221	-
- divers	"	271	135	206	126	18
TOTAL	"	4271	3382	1380	1772	2018
EXPORTATIONS						
- cacao	tonne	12668	13586	12494	16293	9899
- café	"	4311	1377	4562	2834	102
- bois(grumes)	"	125892	117809	108337	97261	103600
- bois(débités)	"	26885	21241	21708	15648	11773
- divers	"	36	58	7	7	6
TOTAL EXPORT	tonne	169793	154071	147108	132043	125380
TOT.IMP.+EXP.	tonne	174064	157453	148488	133815	127398
Nombre navires	nombre	91	70	61	83	78

Source: ONPC.

Le trafic au port de Kribi-Campo poursuit son ralentissement observé depuis 1984. le trafic total a atteint 127.398 tonnes (dont 2.018 tonnes pour les importations et 125.380 tonnes pour les exportations) contre 132.043 tonnes en 1986, soit une regression de 3,5%.
En dehors de ces deux ports d'importance variable, il existe deux autres à Limbé-Tiko et à Garoua dont l'activité est très mineure et saisonnière.

A.4.2. AEROPORTS

Des 65 aérodromes ouverts à la circulation aérienne publique et 31 aérodromes privés, seuls deux aéroports peuvent accueillir des avions gros porteurs type B. 747: aéroports de Douala et Garoua; quatre sont équipés pour l'accueil des moyens courriers type B. 737: Yaoundé-Maroua_Ngaoundéré et Bamenda. Les autres aérodromes sont accessibles aux appareils type HS 748 ou à des avions légers.
Dans l'ensemble, les aérodromes du Cameroun desservis par Camair sont au nombre de 11:
Douala-Yaoundé-Ngaoundéré-Garoua-Maroua-Bamenda-bafoussam-Koutaba-BertouaBatouri-Kribi. La gestion et la sécurité de ces aérodromes est confiée à l'ASECNA.
Le reste est constitué d'aérodromes de moindre importance praticables surtout en saison sèche et ne disposant ni de kérosène, ni d'équipements techniques.
En 1984, tous les aérodromes du Cameroun ont enregistré en arrivées et départs 1.121.000 passagers et en transit 145.900 passagers, soit un total de 1.267.000 passagers.
Les mouvements d'avions (nombre) pour la même année se chiffraient ainsi qu'il suit:

- Vols commerciaux : 31.122.-
- Compagnie nationale: 19.724.-
- Autres vols : 26.889.-

B. TELECOMMUNICATIONS

Le réseau national des télécommunications offre les services suivants:

- téléphone: 34 centraux téléphoniques électro-mécaniques interconnectés entre eux par plus de 4500 km de faiseaux hertziens.
Capacité globale: 37.700 lignes. Cette capacité devrait être plus grande avec la construction des centraux numériques téléphoniques à Yaoundé et Douala dont

la liaison connait le taux de saturation le plus élevé.

- télex: 2 centraux télex-électroniques à Yaoundé et Douala d'une capacité respective de 1420 et 2000 terminaisons.

- télégraphe: l'échange de télégrammes est organisé autour d'un réseau radio et d'un réseau GENTEX.

- transmission de données: ouvert officiellement au public en 1986.

- radio-activité privée: compte actuellement 250 usagers.

- service télécopie: en fonctionnement.

Au niveau international, la société Intelcam assure l'accès des usagers au réseau international (téléphonique, télégraphique et télex) à travers:

- le centre téléphonique (CT2) de Yaoundé qui permet des liaisons directes avec 15 pays et à travers eux avec d'autres pays.
- les centres de télex national et international (CTNI) de Yaoundé et Douala.
- le commutateur automatique des messages (CAM).
- le centre des télécommunications par satellite (CTS) de zamengoe qui est la porte vers l'extérieur des télécommunications du pays.
- l'ensemble des installations de douala, reliées à Yaoundé pour la plupart des échanges avec l'étranger.

IV. SITUATION SANITAIRE

1. La politique de santé s'articule autour des principaux points suivants:

* Meilleure couverture sanitaire du pays afin de résorber les déséquilibres dans la répartition spatiale des infrastructures sanitaires par un développement des infrastructures et des équipements.

* Priorité à la médecine préventive.

* Sensibilisation des population aux problèmes de santé par des campagnes portant sur les soins de santé primaire.

* La recherche sur les maladies tropicales, les maladies sexuellement transmissibles et la stérilité et informatisation de la gestion des équipements, la carte sanitaire, les statistiques démographiques et sanitaires.
- La formation du personnel.

* Les 10 principaux cas de morbidité au Cameroun (1er semestre 1989) par ordre

1. PALUDISME	422.911 cas
2. MALADIES DE LA PEAU	215.542 cas
3. VERS INTESTINAUX	171.303 cas
4. RHUMES - ANGINES	127.638 cas
5.DIARRHEES GRAVES	92.300 cas
6. RHUMATISMES	85.396 cas
7. BRONCHO-PNEUMONIES	78.457 cas
8. AFFECTION CAVITE BUCCALE	75.945 cas
9. INFECTION GONOCOCI.N.C	60.225 cas
10. INFECTION GONOCOCI- GONO	59.987 cas

* Les 10 principales causes de décès au Cameroun (1er semestre 1989) par ordre

1. PALUDISME	275 cas
2. DIARRHEES GRAVES	161 cas
3. ROUGEOLE	160 cas

4. PNEUMONIE	159 cas
5. MENINGITE CEREBRO-SPINALE	152 cas
6. ANEMIES	133 cas
7. BRONCHO-PNEUMONIES	114 cas
8. MALADIES HYPERTENSIVES	93 cas
9. TETANOS	81 cas
10. DREPANOCYTOSE	71 cas

EFFECTIF DU PERSONNEL MEDICAL ET PARAMEDICAL.

TYPE DE PERSONNEL	ANNEES			
	1985	1986	1987	1988
MEDECINS	771	809	888	945
CHIRURGIENS-DENTISTES	43	43	48	53
PHARMACIENS	191	191	201	256
HYGIENISTES SANITAIRES	2	2	2	
TECHNICIENS DE LA SANTE	686	789	827 *	
SAGES FEMMES-ACCOUCHEURS			*	
INFIRMIERS	4875	5208	5418 ******	12748
AIDES-SOIGNANTS	5347	5780	6520	5011
TOTAL	11915	12822	13904	18963

NOMBRE DE FORMATIONS SANITAIRES

FORMATIONS SANITAIRES	ANNEES			
	1984	1985	1986	1987
HOPITAUX	228	238	247	251
CENTRE DE SANTE DEVELOPPES	259	265	267	281
CENTRE DE SANTE ELEMENTAIRE	464	491	488	528
MATERNITES ET CENTRE DE P.M.I.	72	83	97	137
DISPENSAIRES ET INFIRMERIES	462	544	548	588
PHARMACIES	117	142	157	177
PROPHARMACIES	169	180	180	220
TOTAL	1771	1943	1984	2182

CAPACITE HOSPITALIERE

(NOMBRE DE LITS)

PROVINCES	ANNEES			
	1985	1986	1987	1988
ADAMAOUA-EXTREME-NORD & NORD	3796	3866	3892	4586
CENTRE ET SUD	6215	6285	6893	6285
NORD-OUEST	2445	2515	2757	3118
SUD-OUEST	2730	2800	3078	2800
LITTORAL	4501	4571	5016	4636
EST	1539	1609	1762	1609
OUEST	5156	5226	5735	6251
TOTAL	26382	26872	29123	29285

Source: Ministère de la Santé.

V. SITUATION ECONOMIQUE GENERALE

TAUX D'INFLATION ANNUEL

1982/83 : 12,7%
1983/84 : 13,6%
1984/85 : 11,2%

Dans son document "Rapport sur le développement dans le monde" la Banque Mondiale donne un taux moyen d'inflation annuel de 8,1% de 1980 à 1987.

TAUX D'INTERET SUR CREDITS

par arrêté du Ministère des Finances du 5 avril 1989, il était institué de nouvelles conditions de Banque dont l'article 15 définit les éléments entrant dans la détermination d'un taux d'intérêt débiteur final applicable à la

clientèle qui sont:

- taux de base débiteur identique à court ou à moyen terme pour les opérations privilégiées (6,50%) et identique pour les opérations ordinaires à court ou à moyen terme (9,50%). Il faut dire qu'il est institué un taux minimum et un taux maximum.

- rénumération de la Banque
- Commissions assises sur les concours mis en place
- impôts et pélèvements divers (ICAI + TDC) au profit de l'Etat ou d'institutions publiques.

Les composantes de calcul de ces différents taux sont présentés dans les tableaux ci-après:

TABLEAU 1: TAUX D'INTERET DEBITEURS FINAUX AUX OPERATIONS A COURT TERME

	OPERATIONS PRIVILEGIEES		OPERATIONS ORDINAIRES	
	Taux minimum	Taux maximum	Taux minimum	taux maximum
T B D	6,50%	6,50%	9,50%	9,50%
+Rémun. Bque	+4 3/8%	+6 3/8%	+5 1/2%	+5 7/8%
+ T D C	+ 1%	+ 1%	+ 1%	+ 1%
+ I C A I	+1,195%	+1,65%	+1,69%	+1,69%
Taux finaux	13,07%	15,29%	17,65%	18,065%

TABLEAU 2: TAUX D'INTERET DEBITEURS FINAUX APPLICABLES AUX CONCOURS A MOYEN TERME

	OPERATIONS PRIVILEGIEES		OPERATIONS ORDINAIRES	
	Taux minimum	Taux maximum	Taux minimum	Taux maximum
T B D	6,50%	6,50%	9,50%	9.50%
+Cion d'eng.BEAC	+0,25%	+0,25%	+0,25%	+0.25%
+Cion d'eng.Bque	+0,25%	+0,25%	+0,25%	+0,25%
+Rémunérat. Bque	+3 1/2%	+6 1/4%	+4 1/4%	+5 7/8%
+ T D C	+1%	+1%	+1%	+1%
+ I C A I	+1,15%	+1,48%	+1,59%	+ 1,75%
Taux finaux	12,65%	15,73%	16,84%	18,625%

CONTROLE DES PRIX / SYSTEME DES PRIX

Dans l'optique de la libéralisation de l'économie décidée par le Gouvernement, certaines mesures ont été prises ayant pour but la suppression progressive des mécanismes d'homologation des prix, la fixation des marges etc..
Il s'agit de trois textes qui redéfinissaient les conditions de fixation des prix industriels et commerciaux ainsi que les procédures de contrôles de l'administration.

La première circulaire n° 044/MINDIC/CAB précise les domaines de compétenses des différents services chargés du contrôle des prix:

- La Direction des prix s'occupe du suivi des grands commerçants du pays.
- Les services provinciaux établis dans les grandes villes contrôlent les petits importateurs frontaliers exclusivement, les grossistes non importateurs, les grandes surfaces, les petites et moyennes industries et les artisans.
- Les brigades départemantales s'occupent des commerçants au détail.

Enfin, seuls le directeur des prix et les délégués provinciaux peuvent initier les contrôles.

Le deuxième arrêté n° 100/ Déc. 88 fixe les éléments constitutifs du prix de revient, des marges bénéficiaires applicables aux produits de fabrication locale et ceux importés, ainsi qu'aux prestations de service.
Les modifications apportées à l'ancienne règlementation et visant à rétablir la vérité des prix portent sur:
- le taux de commission du bureau d'achat et l'assiette d'application: taux unique 5% du prix FOB pour tous les produits.
- les droits et taxes perçus par l'état.
- les frais de personnel
- les frais financiers sur fonds de roulement et crédits à court terme sont désormais admis dans la structure des prix, mais à concurrence de 50% des sommes effectivement payées.

Il y ainsi une harmonisation de l'assiette des marges de distribution et leurs bases d'application tant pour les produits importés que pour ceux fabriqués localement, consacrant de fait la notion de prix de revient commercial. Autre innovation, la définition d'une structure des tarifs de prestation de service et la fixation des marges bénéficiaires (15% du prix de revient). Enfin les arrêtés n° 10 et 011 du 19 janvier 1989 organisent la libéralisation des prix dans certaines directions: quatres principales nouveautés:

1. Réduction de la liste des produits et prestations de service soumis à la lourde procédure d'homologation des prix.
Ainsi pour les produits issus de l'industrie locale, 35 seulement restent concernés par cette procédure au lieu de la totalité comme dans l'ancien texte. 35 également sont retenus parmi les produits importés contre 87 auparavant. Et pour les prestations de service, 10 catégories seulement restent visées au lieu de l'ensemble comme avant.

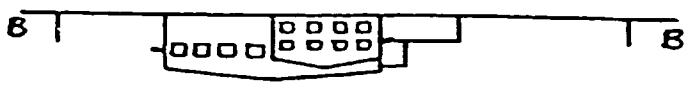
2. Ensuite l'égalité de traitement entre les produits importés et ceux fabriqués localement est confirmée: alors que les produits importés étaient immédiatement mis en vente sur le marché local, ceux fabriqués au cameroun devaient attendre une décision ministérielle pour être commercialisés. Il n'en sera plus ainsi.

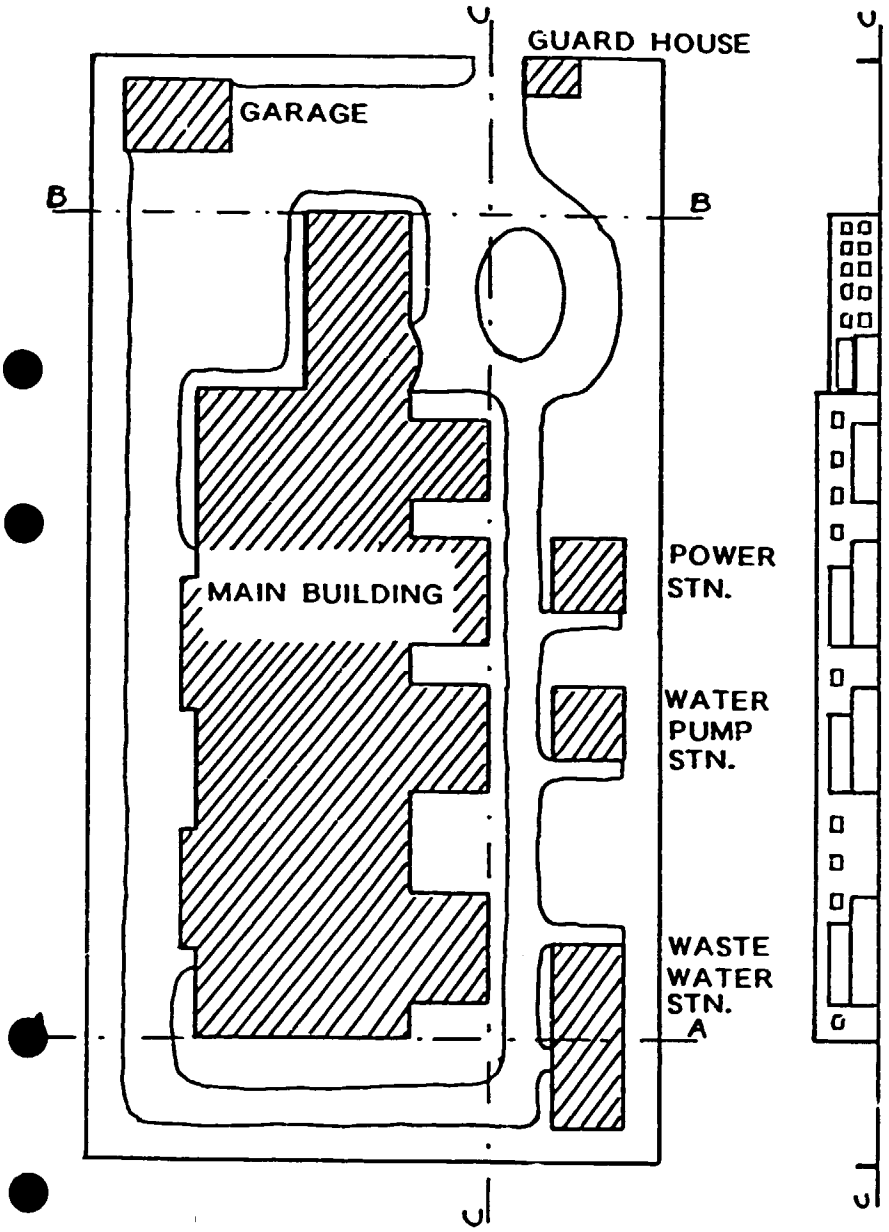
3. Le visa ministériel est supprimé sur les actes d'homologation des prix

préparés en province, ce qui confirme une décentralisation des pouvoirs au bénéfice des délégués provinciaux.

4. La libéralisation des prix est étendue à de nouveaux secteurs.

En conclusion la procédure d'homologation des prix demeure toujours en vigueur, tant au niveau national qu'à celui des provinces, mais seulement il ne s'applique plus qu'à une certaine catégorie (réduite) de produits.
La structure de fixation des prix et des marges demeure la même pour tous les produits (importés et de fabrication locale) la concurrence est désormais ouverte.





Pharmadule

APHAS CAMEROON

PLANT LAYOUT

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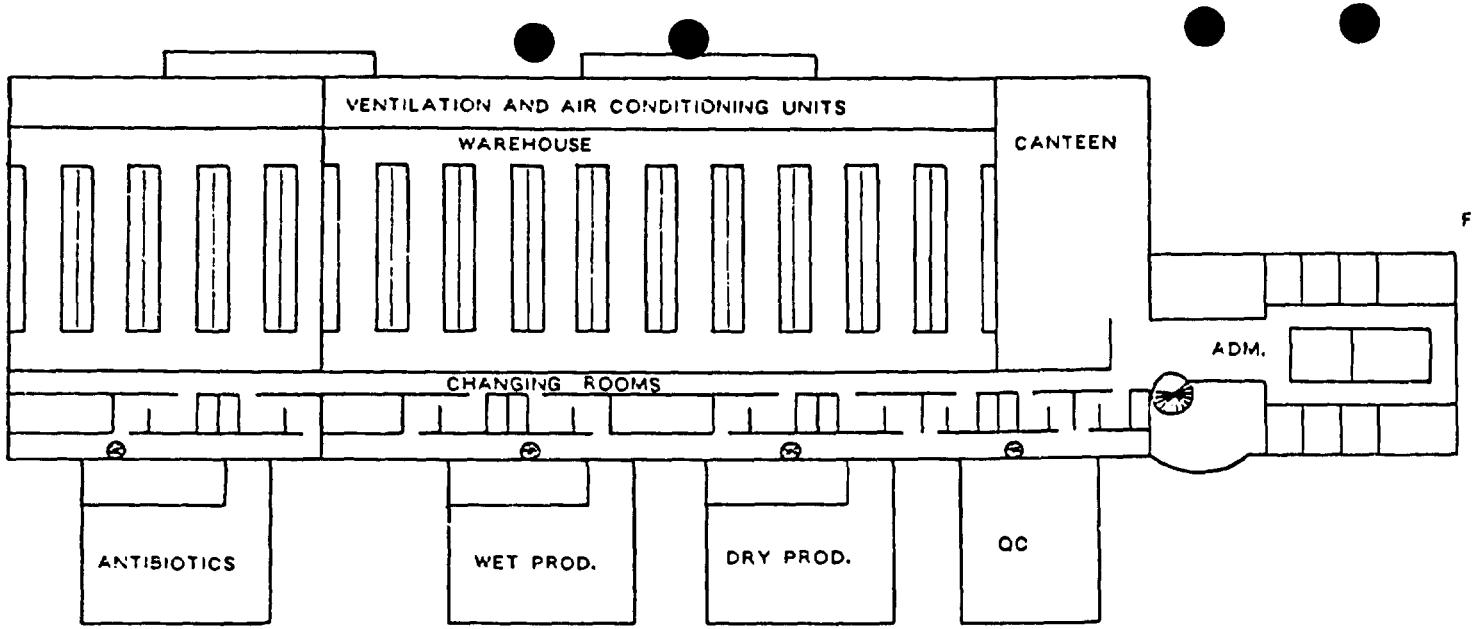

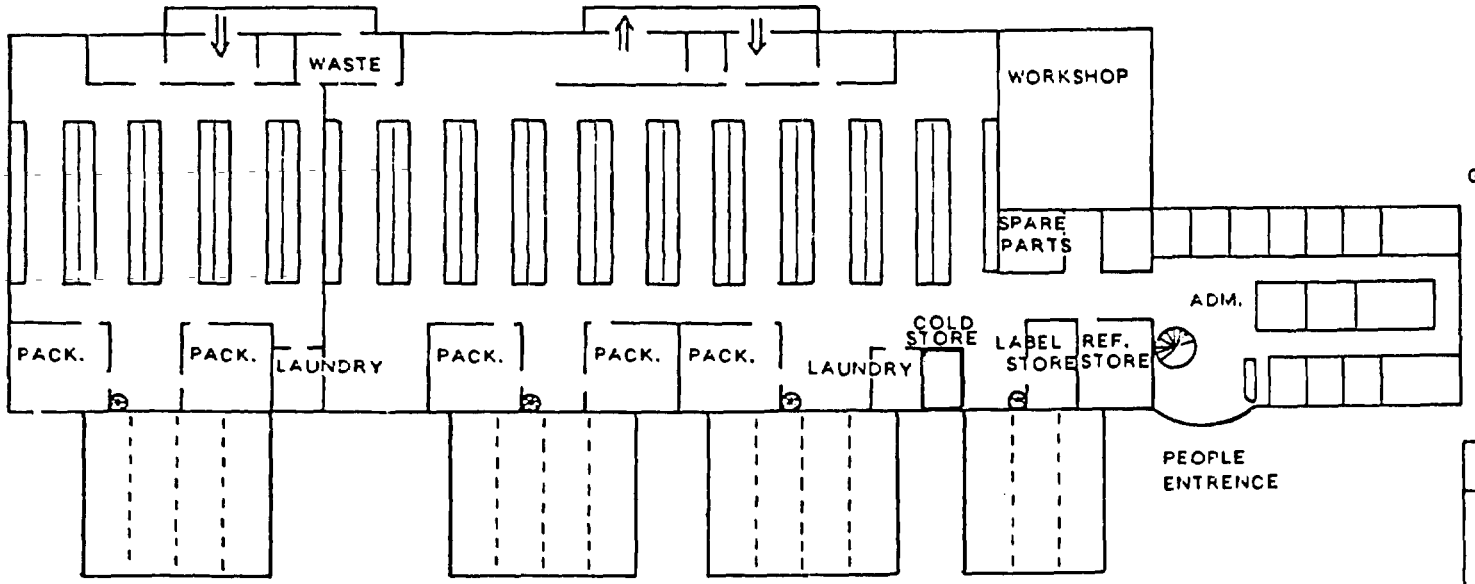

Pharmadule

APHAS CAMEROON

MAIN BUILDING

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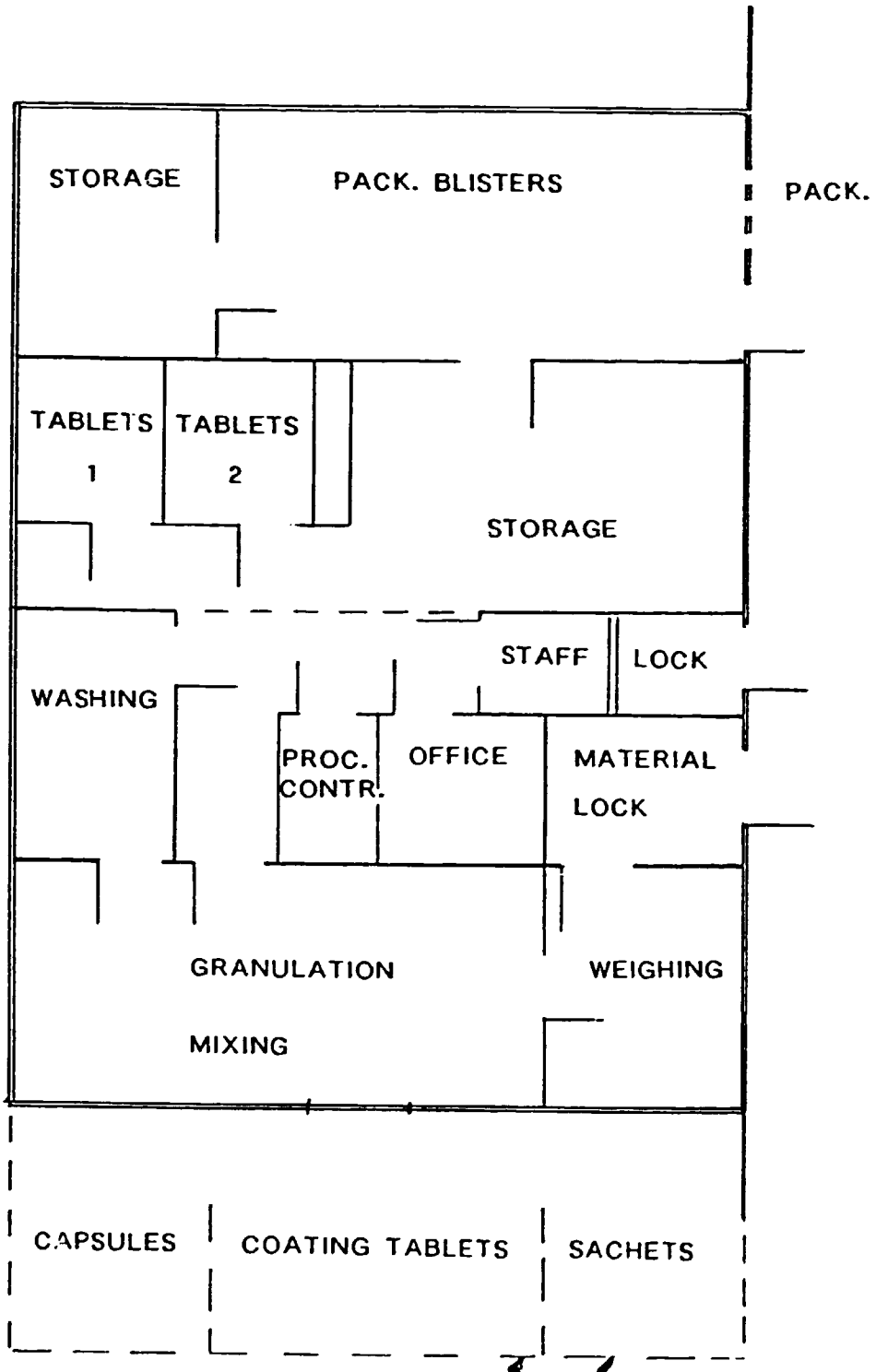
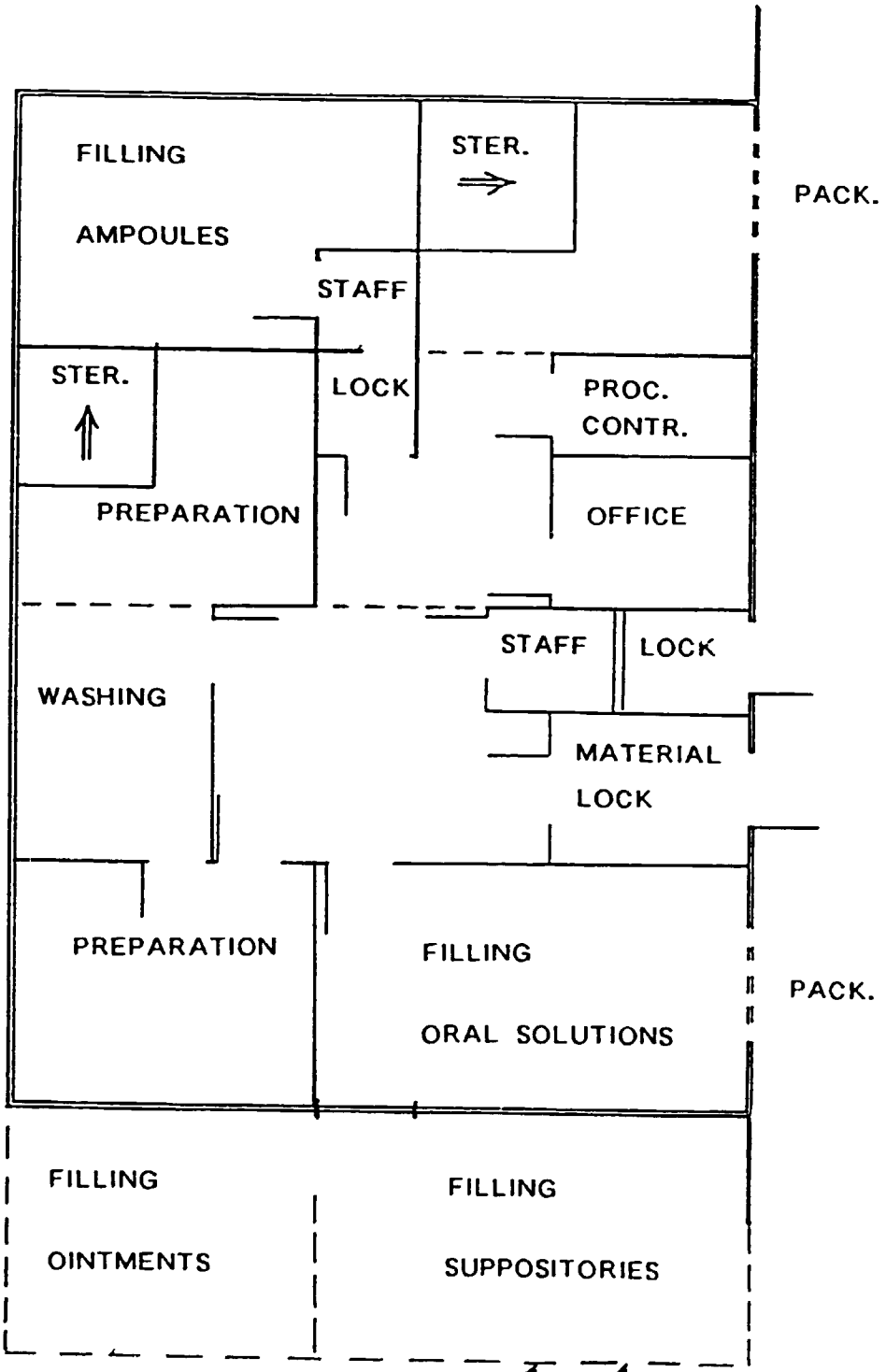


Pharmadule

APHAS CAMEROON

MANUF. UNIT DRY PRODUCTS

1:100

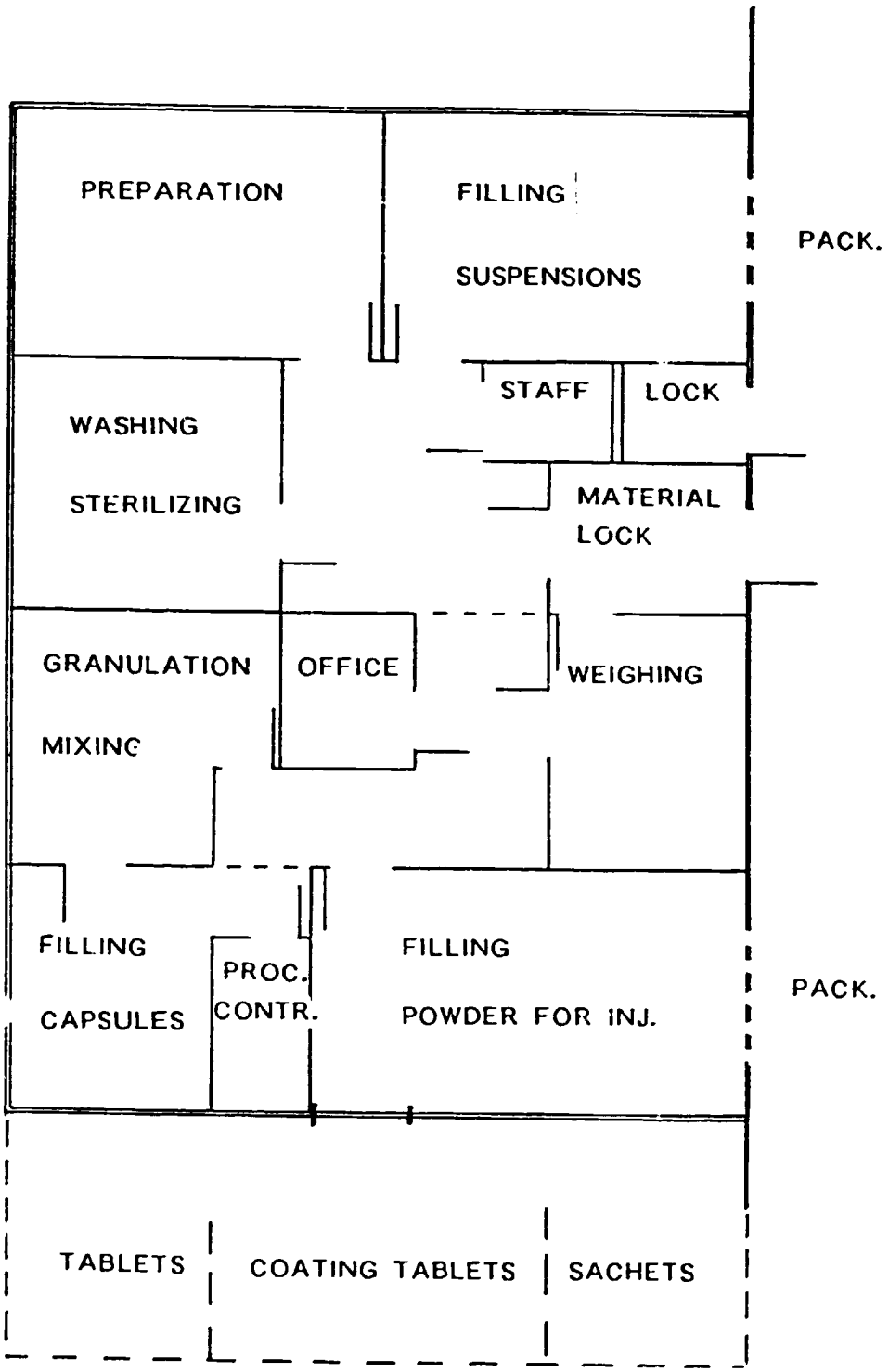


Pharmadule

APHAS CAMEROON

MANUF. UNIT WET PRODUCTS

1:100

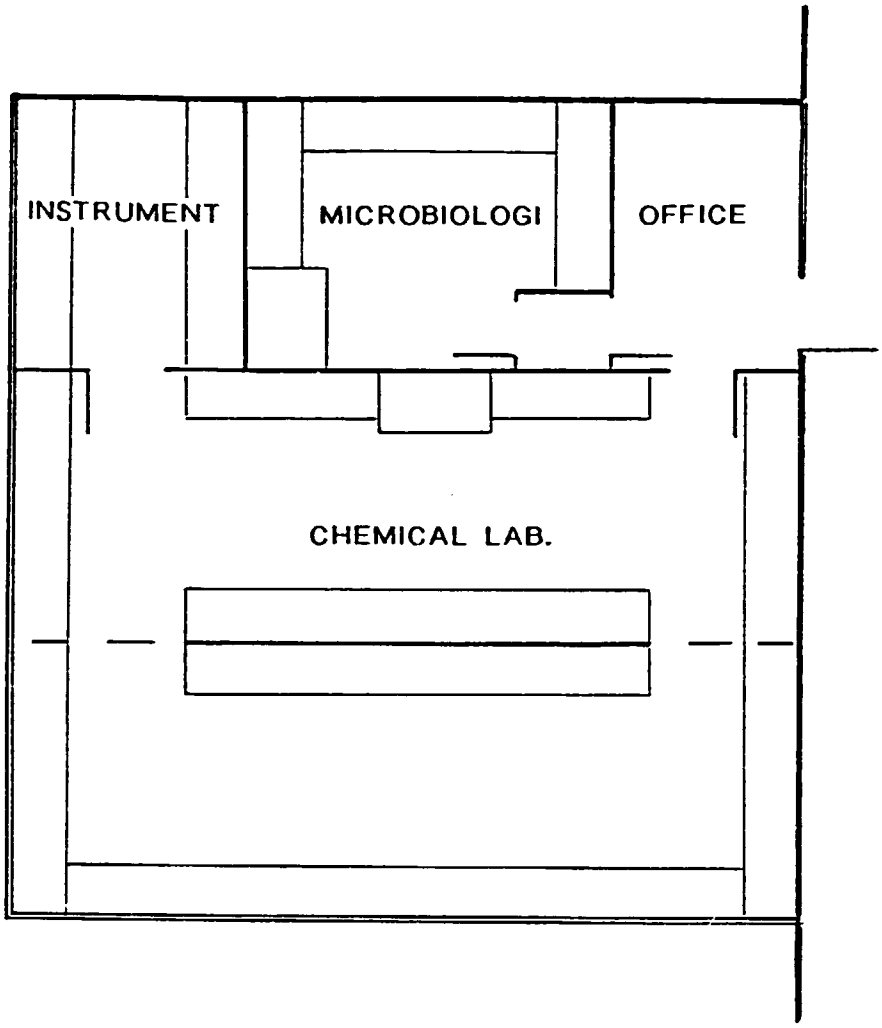


Pharmadule

APHAS CAMEROON

MANUF. UNIT ANTIBIOTICS

1:100

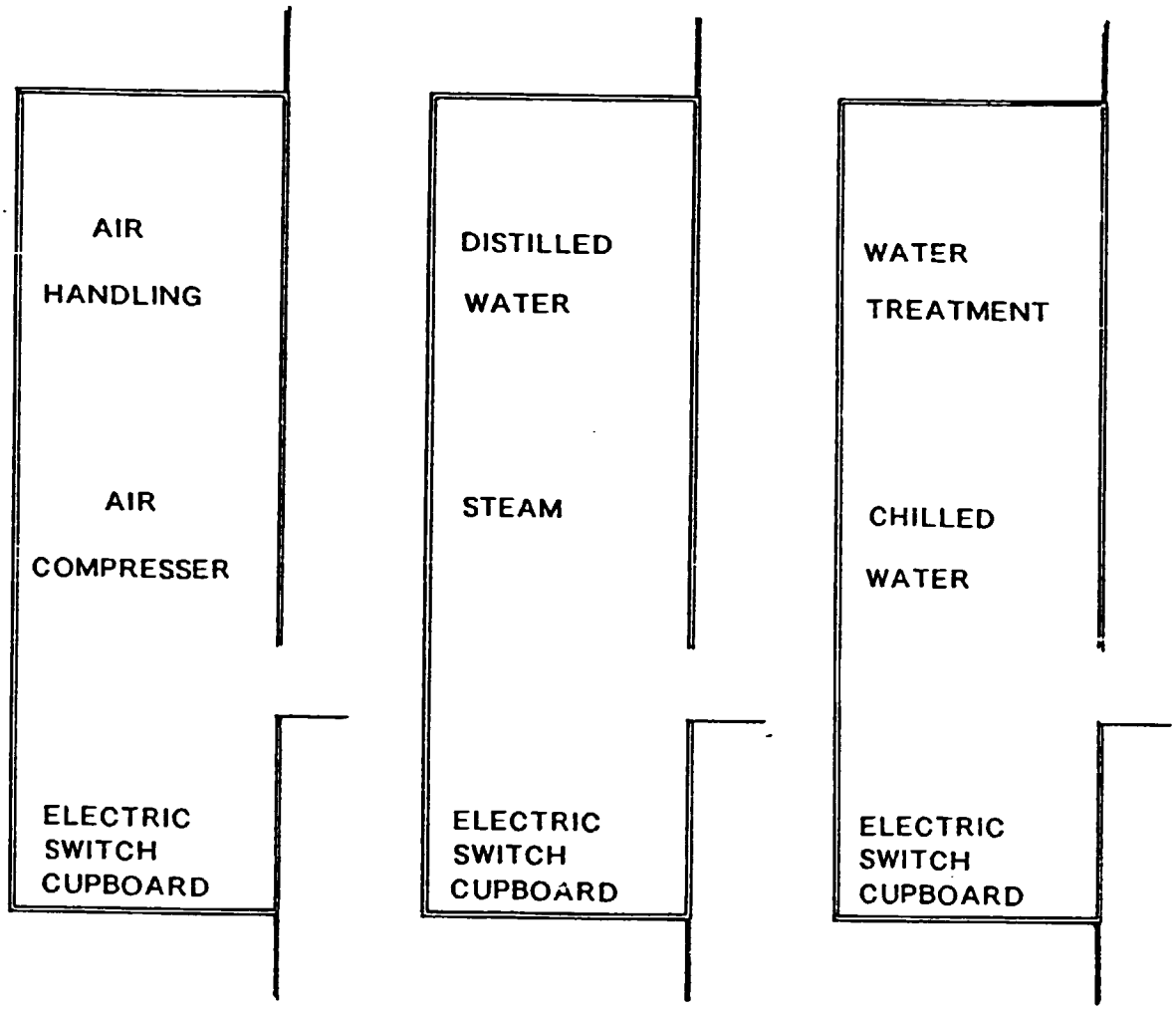


Pharmadule

APHAS CAMEROON

QUALITY CONTROL

1:100



Pharmadule

APHAS CAMEROON

UTILITIES

1:100

Chapter 8 Manpower Manning table

Department	Function	Univ.	Voca.	Basic	Total
General management	General manager	1	0	0	1
	Secretaries		2	0	2
Total		1	2	0	3
Marketing department	Marketing manager	1	0	0	1
	Secretary	0	2	0	2
	Market res.mgr	1	0	0	1
	Product managers	4	0	0	4
	Field sales mgr	1	0	0	1
	Secretary	0	1	0	1
	Area managers	4	0	0	4
	Medical rep's	9	0	0	9
Total		20	3	0	23
Production department	Production manager	1	0	0	1
	Secretary	0	1	0	1
	Section supervisors	0	4	0	4
	Line supervisors	0	0	6	6
	Workers	0	0	36	36
	Mechanical engineer	0	1	0	1
	Electrical engineer	0	1	0	1
	Process engineers	0	2	0	2
	Process technicians	0	2	0	2
	Building technician	0	1	0	1
	Workers	0	0	2	2
Total		1	12	44	57
MA-dept	MA-manager	1	0	0	1
	Secretary	0	1	0	1
	Purchase manager	0	1	0	1
	Purchase clerk	0	1	0	1
	Warehouse sup:vr	0	1	0	1
	Stores sup:vr	0	1	0	1
	Workers	0	0	6	6
	Transport sup:vr	0	1	0	1
	Drivers	0	3	0	3
Total		1	9	6	16
QC-dept	QC Manager	1	0	0	1
	Chemist	1	0	0	1
	Microbiologist	1	0	0	1
	Laboratory ass:ts	0	6	0	6
	Pharmacists/Chem:sts	3	0	0	3
Total		6	6	0	12

Legal and Medical Affairs Dept	Manager(Pharmacist)	1	0	0	1
	Secretary	0	1	0	1
	Pharmacist	1	0	0	1
	Documentalist	0	1	0	1
	Lab.ass:t	0	1	0	1
	M.D./Pharmacologist	1	0	0	1
	Librarian	1	0	0	1
Total		4	3	0	7
Admin.dept	Admin.manager	1	0	0	1
	Secretary	0	1	0	1
	Financial manager	1	0	0	1
	Cashier	0	1	0	1
	Accountants	1	1	0	2
	Accounting clerks	0	2	0	2
	Personnel manager	1	0	0	1
	Recruitment officer	0	1	0	1
	Clerk	0	1	0	1
	Gen.services manager	1	0	0	1
	Security officer	0	1	0	1
	Guards	0	0	3	3
	Canteen matron	0	1	0	1
	Canteen helpers	0	0	2	2
	Nurse	0	1	0	1
	Nurse ass:t	0	1	0	1
	Gardener	0	1	0	1
	Receptionists/Tele-operators	0	2	0	2
Total		5	14	5	24
Grand total		38	49	55	142

Project implementation schedule
Chapter IX.1990-08-16/ss

Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
1.	PREPARATORY STEPS	.#####	#	
1.1	Receipt of feasibility study	.x...		
1.2	License negotiations 50 % coverage	..xx.		
1.3	License negotiations 100 % coverage	..xxx	x	
1.4	Investment discussion and decision	...x.		
1.5	Supply & techn.assist. agreement	...x.		
1.6	Shareholder's agreement	...x.		
1.7	Project financing agreements	x		

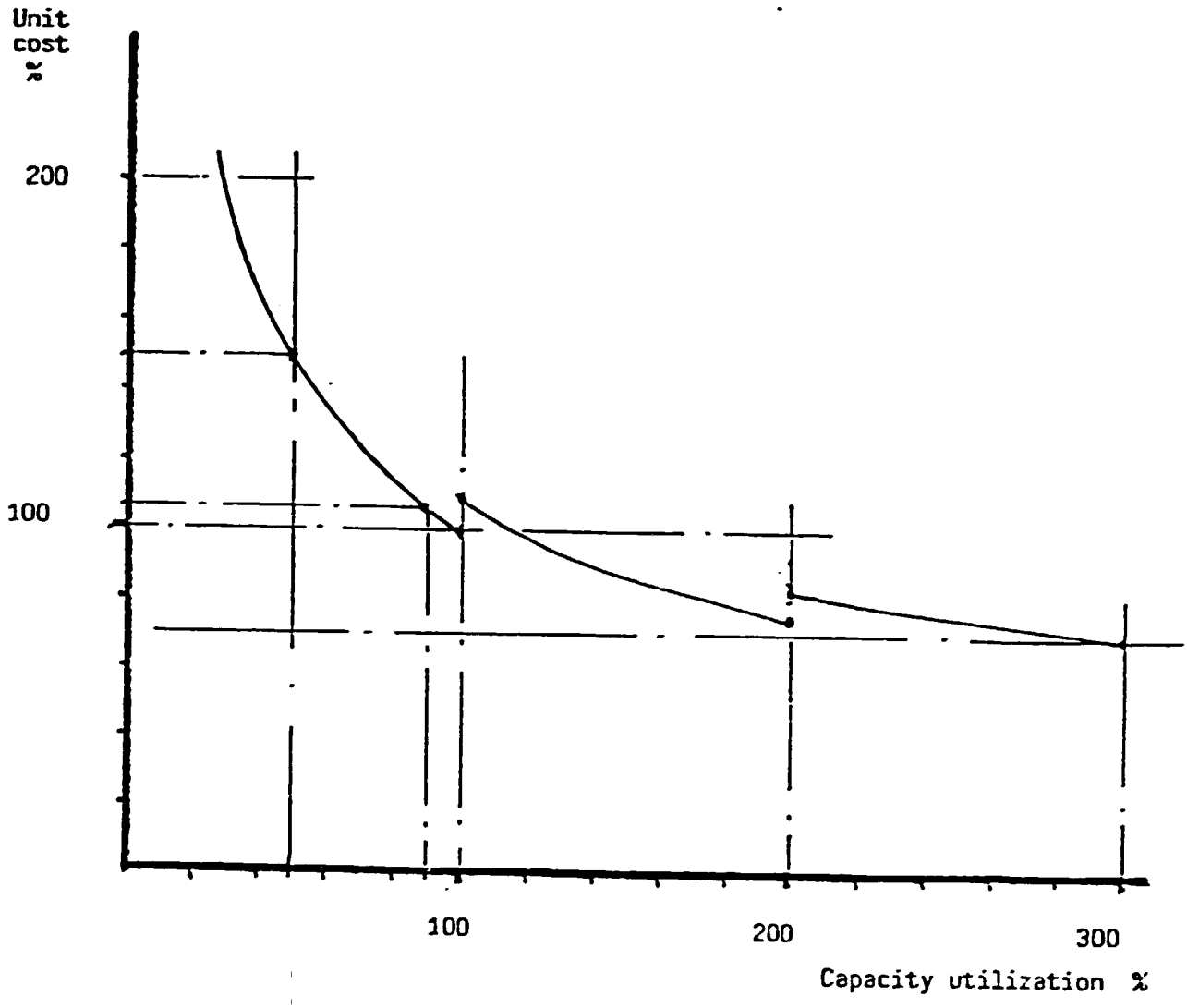
Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
2.	FINAL DESIGN	....#	##	
2.1	Room spec's	x	x	
2.2	Process			
2.2.1	Process descriptions	x	x	
2.2.2	Layout, production modules	x	x	
2.2.3	Layout, laboratory modules	x	x	
2.2.4	Spec's production eq.	x	x	
2.2.5	Spec's laboratory eq.	x	x	
2.2.6	Process flow diagrams	x	x	
2.3	Utilities			
2.3.1	Layout utility module	x	x	
2.3.2	Utilities layout, other modules	x	x	
2.3.3	Spec's mechanical eq.	x	x	
2.3.4	Spec's electrical eq.	x	x	
2.3.5	Mech. utilities flow diagram	x		
2.3.6	Electr.utilities flow diagram	x	x	
2.4	Final design coordination	x		
2.5	Spec's for util.supply by Owner	x		
2.6	Design spec's for build.at site	x		
2.7	Project time schedule	xx		
2.8	Block diagrams, consumptions	x		

Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
3.	DETAIL DESIGN	.....#	####	
3.1	Revised room spec's	.....	xxxx	
3.2	Process			
3.2.1	Rev.process description	.....	.xxx	
3.2.2	Rev.layout, production modules	.....	.xxx	
3.2.3	Rev.layout, laboratory modules	.....	. x	
3.2.4	Rev..eq.spec's production	.....	xxx	
3.2.5	Rev.eq.spec's laboratory	.....	x	
3.2.6	Rev.flow diagrams	.....	x	
3.3	Utilities			
3.3.1	Rev.layout utility module	.....	xxxx	
3.3.2	Rev.layout other modules	.....	xxxx	
3.3.3	Rev.spec's mech.eq.	.....	xx	
3.3.4	Rev.spec's electr.eq.	.....	xxx	
3.3.5	Rev..flow diagram, mech.util.	.....	xxx	
3.3.6	Rev.flow.diagram, electr.util.	.....	xx	
3.4	Detail design coordination	.....	xxxx	
3.5	Rev.spec's for the owner suppl.util	.....	.xxx	
3.6	Rev.design spec's for site build.	.....	..xx	
3.7	Rev. project time schedule	.....	..xx	
3.8	Rev. block diagr..consumptions	.....	..xx	

Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
4.	PRODUCT FILES, INSTRUCTIONS, TESTS	.....	###########	###########
4.1	Master files	.....		
4.1.1	Master files from licensors 1-6	.....	xxxxx	
4.1.2	Master files from licensors 7-12	.....	..xxxxx	
4.1.3	Additional master files	.....	xxxxx	
4.2	Process operating instructions	.....		
4.2.1	Prel.plant oper.instr.(incl.GMP)	.....	xxxxxx	
4.2.2	Final plant.oper.instr.(incl.GMP)	.....	.....	.xxxx
4.2.3	Prel.process equipment.oper.instr.	.....	xxxxxx	
4.2.4	Final process equipment oper.instr.	.....	.....	.xxxx
4.3	Validation support by Supplier	.....	xxxx	xxxxxxxxxxx
4.4	Plant inspection by Owner	.....	xx	
4.5	Services operating instructions	.....	.....	
4.5.1	Mech.services oper.instr.(incl.GMP)	.....	xxx	xx
4.5.2	Electr.services.oper.instructions	.....	xxx	xx
4.6	Laboratory instructions	.....	.....	
4.6.1	Laboratory equipment instr.	.....	xxx	x

Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
4.7	"As-built"-drawings		xx	xxxx.....
4.8	Maintenance instructions		xxx	xx.....
4.9	Machine tests		xx	xx.....
4.10	Production capacity tests (in CMR)		.....	.....xxx...
4.11	Quality tests (in CMR)		.....	.....xxx...
Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
5.	EDUCATION AND TRAINING		..##....####	###.#####....
5.1	E & T agenda		..xx.....	.....
5.2	E & T in Sweden		x	xx.....
5.3	E & T at licensor's premises		xxxx	xxx.....
5.4	E & T in CMR		.....	....xxxx....
Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
6	EQUIPMENT DELIVERY AND INSTALLATION		############	##.....
6.1	Delivery of water treatment eq.		.........xx.	.....
6.2	Delivery of sterilizing eq.		.........xx.	.....
6.3	Delivery of air conditioning eq.		.........xx.	.....
6.4	Delivery of laboratory fittings		.........xx.	.....
6.5	Delivery of laboratory eq.		x	x.....
6.6	Building of modules		....xxxxxx..	.....
6.7	Delivery of process eq.		xxx	.....
6.8	Inst. of equipment in modules		xx	xx.....
6.9	Tests of machinery and systems		xx	xx.....
6.10	Purchase and inst.coordination		xxxxxxxxxxx	xx.....
Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
7.	DELIVERY OF PLANT		.....	.#######
7.1	Elaboration of shipping documents		.....	.x.....
7.2	Closing modules for shipment		.....	..x.....
7.3	Shipment		.....	.....
7.3.1	Port handling in Gothenburg		.....	..x.....
7.3.2	Ocean transport		.....	...x.....
7.3.3	Port handling in Douala		.....	....x.....
7.3.4	Transport to site		.....	....x.....
7.4	Installation of plant		.....	....xx.....
7.5	Running-in of plant		.....	.....xx....
7.6	Commissioning of plant		.....	.....x...
Item No	Content	1990 ASOND	1991 JFMAMJJASOND	1992 JFMAMJJASOND
8.	WORKS AND PREPARATIONS BY OWNER		#########x	###########
8.1	Permits		.....	.....
8.1.1	Import of modules,eq. and materials		xxxx	.....
8.1.2	Permits for constr. and start-up	x	.....	.....
8.2	Buildings and utilities		.....	.....
8.2.1	Design of buildings		xxxx.....	.....
8.2.2	Design of bases for modules		...xx.....	.....
8.2.3	Site preparation works		xxxxxxxx	xxxx.....
8.2.4	Construction of buildings		xxxxxxxx	xx.....
8.2.5	Construction of bases for modules		xxx	xxxx.....
8.2.6	Rev.spec's for the owner suppl.util		xxxx.....	.....
8.2.7	Inst.of connecting utilities		xxxx	xx.....
8.3	Validation		xxxx	xxxxxxxxxx.
8.4	Plant inspection by Owner		.....x.	.....
8.5	Transformer station		...xxxxxxxx	xxx.....
8.6	Communications equipment		...xxxxxxxx	xxx.....
8.7	Fire fighting equipment		...xxxxxxxx	xxx.....
8.8	Transfer and transport equipment		...xxxxxxxx	xxx.....
8.9	Packing equipment		...xxxxxxxx	xxx.....
8.10	Water well		...xxxxxxxx	xxx.....
8.11	Waste water plant		...xxxxxxxx	xxx.....
8.12	Employment of personnel		.....	.....
8.12.1	Management		1..2...3..4.	.....
8.12.2	Staff		xx	xxxx.....
8.12.3	Labour		.....	.....xxx..
8.12.4	Owner's Resident Engineer		xxxxxxxxxxx	xxxxxxxxxxx
8.12.5	Supplier's Project Manager (CMR)		.....	xxxxxxx

UNIT COST OF PHARMACEUTICAL PRODUCTION VS. CAPACITY UTILIZATION



Capacity unit: 1 shift 5 days/week = 100%

Projected income statement for the fiscal years 1990-2000 (1000 USD)
Most realistic case

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
100	REVENUE											
110	Sales revenue	0	0	3.144	10.000	10.599	11.659	12.826	14.110	15.525	17.082	18.798
120	Less: Opening inventory	0	0	0	262	830	880	970	1.070	1.180	1.294	1.424
130	Add: Closing inventory	0	0	262	830	880	970	1.070	1.180	1.294	1.424	1.567
140	Others	0	0	0	0	0	0	0	0	0	0	0
199	NET SALES REVENUE	0	0	3.406	10.568	10.649	11.749	12.926	14.220	15.639	17.212	18.941
009	AGENCY COMMISSION	0	222	314	0	0	0	0	0	0	0	0
200	DIRECT COSTS											
210	Variable:											
211	Raw materials	0	0	429	1.332	1.342	1.480	1.629	1.792	1.971	2.169	2.387
212	Packaging materials	0	0	647	2.008	2.023	2.232	2.456	2.702	2.971	3.270	3.599
213	Wages in production	0	0	277	855	881	907	943	1.000	1.060	1.124	1.191
214	Consumables	0	0	61	188	194	199	207	220	233	247	262
215	Utilities	0	0	117	364	375	386	402	426	451	478	507
216	Others	0	0	0	0	0	0	0	0	0	0	0
219	SUBTOTAL	0	0	1.531	4.746	4.814	5.205	5.637	6.139	6.686	7.288	7.945
220	Fixed:											
221	Salaries (QC,MA)	0	0	141	434	447	460	474	488	503	518	534
222	Consumables	0	0	12	37	38	39	40	42	43	44	46
223	Utilities	0	0	61	188	194	199	205	212	218	224	231
224	Technical assistance	0	0	65	250	250	250	250	250	250	250	250
229	SUBTOTAL	0	0	279	909	929	949	970	992	1.014	1.037	1.060
299	TOTAL DIRECT COSTS	0	0	1.810	5.655	5.743	6.155	6.607	7.131	7.700	8.325	9.006
399	INCOME LESS COST OF PRODUCTS SOLD	0	222	1.910	4.913	4.906	5.594	6.319	7.089	7.939	8.887	9.935
400	INDIRECT COSTS											
410	Variable:											
411	Factory supplies	0	0	85	262	270	278	286	295	304	313	322
412	Royalties	0	0	136	423	426	470	517	569	626	688	758
413	Others	0	0	0	0	0	0	0	0	0	0	0
419	SUBTOTAL	0	0	221	685	696	748	803	864	929	1.001	1.080
420	Fixed:											
421	Marketing	0	0	128	396	408	420	433	446	459	473	487
422	Administration	0	0	43	132	136	140	144	149	153	158	162
423	Legal Affairs	0	0	43	132	136	140	144	149	153	158	162
424	General Management	0	0	73	225	232	239	246	254	261	269	277
429	SUBTOTAL	0	0	287	885	912	939	967	996	1.026	1.057	1.089
499	TOTAL INDIRECT COSTS	0	0	508	1.570	1.608	1.687	1.771	1.860	1.956	2.058	2.169
599	TOTAL DIRECT AND INDIRECT COSTS	0	0	2.319	7.225	7.351	7.842	8.378	8.991	9.656	10.383	11.174
699	NET INCOME (LOSS)	0	222	1.401	3.343	3.298	3.907	4.548	5.229	5.983	6.829	7.767
700	OVERHEAD COSTS											
710	Interest long-term debt	0	0	0	807	807	691	576	461	346	230	115
711	Interest medium-term debt	0	0	0	350	280	210	140	70	0	0	0
712	Depreciation	0	0	0	945	945	945	945	870	870	870	870
713	Amortization	0	0	0	356	856	856	856	856	0	0	0
714	Depreciation re-investm.	0	0	0	0	0	0	50	150	250	350	450
799	TOTAL OVERHEAD COSTS	0	0	0	2.958	2.888	2.702	2.567	2.407	1.466	1.450	1.435
899	NET PROFIT	0	222	1.401	385	410	1.205	1.981	2.822	4.517	5.379	6.332
999	NET PROFIT AFTER TAX	0	222	1.401	385	410	1.205	1.981	2.822	4.517	5.379	6.332
1999	ACC.NET PROFIT	0	222	1.623	2.008	2.419	3.624	5.605	8.427	12.945	18.323	24.655
6010	ANNUAL INVESTMENT OUTLAYS	120	6.533	8.725	800	0	500	1.000	1.000	1.000	1.000	1.000
6020	ACC.INVESTMENT OUTLAYS	120	6.653	15.378	16.178	16.178	16.678	17.678	18.678	19.678	20.678	21.678
6030	INTERN. RATE OF RETURN %	------	-------	-------		8	8	13	17	20	27	30	33
7010	NET PROFIT/NET SALES REV.	------	-------	-------		4	4	10	15	20	29	31	33
7020	NET INCOME/NET SALES REV.	------	-------	-------		32	31	33	35	37	38	40	41
7030	DIRECT COSTS/ NET SALES REVENUE	------	-------	-------		54	54	52	51	50	49	48	48
7040	INDIRECT COSTS/ NET SALES REVENUE	------	-------	-------		15	15	14	14	13	13	12	11
7050	VARIABLE COSTS/ NET SALES REVENUE	------	-------	-------		51	52	51	50	49	49	48	48
7060	FIXED COSTS/ NET SALES REVENUE	------	-------	-------		28	27	24	21	18	15	14	12

Projected balance sheet and ratios for the fiscal years 1991-2000
Most realistic case.
(Updated version 1990-10-18)

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
100	CURRENT ASSETS										
110	Cash in hand	8.569	28	(945)	753	1.499	2.448	4.275	7.006	11.129	16.261
120	Finished goods	0	193	602	613	654	698	749	805	865	931
130	Accounts receivable	0	386	1.204	1.226	1.308	1.396	1.498	1.610	1.730	1.862
140	Raw material etc. invent.	0	538	1.670	1.683	1.806	2.043	2.247	2.471	2.719	2.993
150	Deposits	0	0	0	0	0	0	0	0	0	0
199	TOTAL CURRENT ASSETS	8.569	1.145	2.531	4.275	5.267	6.585	8.769	11.892	16.443	22.047
200	OTHER ASSETS										
210	Establishment costs	120	120	120	120	120	120	120	120	120	120
220	Preoper. expenses	833	2.401	2.401	2.401	2.401	2.401	2.401	2.401	2.401	2.401
240	Interest during construct	600	1.757	1.757	1.757	1.757	1.757	1.757	1.757	1.757	1.757
250	Less: Acc. amortization	0	0	856	1.712	2.568	3.424	4.278	4.278	4.278	4.278
299	NET OTHER ASSETS	1.553	4.278	3.422	2.566	1.710	854	0	0	0	0
300	FIXED ASSETS										
310	Land+site development	700	700	700	700	700	700	700	700	700	700
320	Buildings	2.800	4.300	4.300	4.300	4.300	4.300	4.300	4.300	4.300	4.300
330	Equipment	1.500	5.700	6.500	6.500	7.000	8.000	9.000	10.000	11.000	12.000
340	Office equipment	0	200	200	200	200	200	200	200	200	200
350	Vehicles	100	300	300	300	300	300	300	300	300	300
360	Less: Acc. depreciation	0	0	945	1.890	2.835	3.830	4.850	5.970	7.190	8.510
399	NET FIXED ASSETS	5.100	11.200	11.055	10.110	9.665	9.670	9.650	9.530	9.310	8.990
499	TOTAL ASSETS	15.222	16.623	17.008	16.951	16.642	17.109	18.419	21.422	25.753	31.037

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
500	CURRENT LIABILITIES										
510	Accounts payable	0	0	0	0	0	0	0	0	0	0
520	Short-term borrowings	0	0	0	0	0	0	0	0	0	0
530	Current maturities	0	0	467	1.514	1.514	1.514	1.514	1.048	1.048	1.048
540	Taxes payable	0	0	0	0	0	0	0	0	0	0
550	Dividends payable	0	0	0	0	0	0	0	0	0	0
599	TOTAL CURRENT LIABILITIES	0	0	467	1.514	1.514	1.514	1.514	1.048	1.048	1.048
600	LONG-TERM DEBT										
610	Long-term loans	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400
620	Medium-term loans	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300
630	Less Acc.maturities	0	0	467	1.981	3.495	5.009	6.523	7.571	8.619	9.667
699	NET LONG-TERM DEBT	9.700	9.700	9.233	7.719	6.205	4.691	3.177	2.129	1.081	33
700	SHAREHOLDER'S EQUITY										
710	Common stock	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300
720	Legal reserve	0	0	0	0	0	0	0	0	0	0
730	Acc.profits (losses)	222	1.623	2.008	2.419	3.624	5.605	8.427	12.945	18.323	24.655
740	Less. Taxes payable	0	0	0	0	0	0	0	0	0	0
750	Less: Dividends payable	0	0	0	0	0	0	0	0	0	0
799	TOTAL EQUITY AND RETAINED EARNINGS	5.522	6.923	7.308	7.719	8.924	10.905	13.727	18.245	23.623	29.955
899	TOTAL LIABILITIES AND SHAREHOLDER'S EQUITY	15.222	16.623	17.008	16.952	16.643	17.110	18.418	21.422	25.752	31.036
910	CURRENT RATIO (2,0-1,2)	-------	-------	5,4	2,8	3,5	4,3	5,8	11,3	15,7	21,0
920	QUICK RATIO (1,2-1,0)	-------	-------	0,6	1,3	1,9	2,5	3,8	8,2	12,3	17,3
930	LONG-TERM DEBT/ EQUITY + RET.EARN	-------	-------	1,74	1,46	1,17	0,89	0,60	0,40	0,20	0,01
940	SHAREHOLDER'S EQUITY/ TOTAL LIABILITIES	-------	-------	0,31	0,31	0,32	0,31	0,29	0,25	0,21	0,17
950	RETURN ON ASSETS	1	8	10	10	15	18	20	24	23	22
960	TURNOVER RATE OF CAPITAL	-------	0,20	0,62	0,63	0,71	0,76	0,77	0,73	0,67	0,61

Projected cash flow statement for fiscal years 1990-2000
Most realistic case
(Updated version 1990-10-18)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
100	OPERATIONAL CASH-FLOW											
110	Net income/loss	0	222	1.401	3.343	3.298	3.907	4.548	5.229	5.983	6.829	7.767
120	Less: Interest	0	0	0	1.157	1.087	901	716	531	346	230	115
130	Less: Increase Prod+RM+PM	0	0	731	1.541	24	164	281	255	280	308	340
140	Less: Increase Acc.Rec.	0	0	386	818	22	82	88	102	112	120	132
150	Increase Acc.Payable	0	0	0	0	0	0	0	0	0	0	0
160	Less: Additional assets	120	4.533	8.825	800	0	500	1.000	1.000	1.000	1.000	1.000
	(Preoperational expenses)	120	833	1.568								
	(Civil works)	0	2.600	2.400								
	(Modules)	0	2.500	3.700	800	0	500	1000	1000	1000	1000	1000
	(Interest during constr.)	0	600	1.157								
199	Total op. cash-flow	(120)	(6.311)	(8.541)	(973)	2.165	2.260	2.463	3.341	4.245	5.171	6.180

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
200	FINANCIAL CASH-FLOW											
210	Increase in equity	0	5.300	0	0	0	0	0	0	0	0	0
220	Long/medium-term loans	0	9.700	0	0	0	0	0	0	0	0	0
230	Less: Loan repayments	0	0	0	0	467	1.514	1.514	1.514	1.514	1.048	1.048
299	Total fin. cash-flow	0	15.000	0	0	(467)	(1.514)	(1.514)	(1.514)	(1.514)	(1.048)	(1.048)
399	CHANGE IN CASH	(120)	8.689	(8.541)	(973)	1.698	746	949	1.827	2.731	4.123	5.132
499	ACC.CHANGE IN CASH	(120)	8.569	28	(945)	753	1.499	2.448	4.275	7.006	11.129	16.261
599	Discount factor 20 %	1,44	1,2	1	0,83	0,69	0,58	0,48	0,4	0,33	0,28	0,23
699	DISC.NET CASH FLOW	(173)	10.427	(8.541)	(808)	1.172	433	456	731	901	1.154	1.180
799	ACC.NET CASH FLOW			6.932								

Enclosure20

Projected income statement for the fiscal years 1990-2000 (10 00 USD)
Most pessimistic case - 30 % lower starting volume
(Updated version 1990-10-18)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
100	REVENUE											
110	Sales revenue	0	0	2.201	7.000	7.419	8.161	8.978	9.877	10.868	11.957	13.159
120	Less: Opening inventory	0	0	0	183	583	618	680	748	823	906	996
130	Add: Closing inventory	0	0	183	583	618	680	748	823	906	996	1.097
140	Others	0	0	0	0	0	0	0	0	0	0	0
199	NET SALES REVENUE	0	0	2.384	7.400	7.454	8.223	9.046	9.952	10.950	12.048	13.259
009	AGENCY COMMISSION	0	155	220	0	0	0	0	0	0	0	0
200	DIRECT COSTS											
210	Variable:											
211	Raw materials	0	0	300	932	939	1.036	1.140	1.254	1.380	1.518	1.671
212	Packaging materials	0	0	453	1.406	1.416	1.562	1.719	1.891	2.081	2.289	2.519
213	Wages in production	0	0	235	727	749	771	802	850	901	955	1.012
214	Consumables	0	0	52	160	165	170	176	187	198	210	223
215	Utilities	0	0	99	309	319	328	341	362	384	407	431
216	Others	0	0	0	0	0	0	0	0	0	0	0
219	SUBTOTAL	0	0	1.140	3.534	3.587	3.867	4.178	4.544	4.943	5.379	5.856
220	Fixed:											
221	Salaries (QC,MA)	0	0	120	369	380	391	403	415	428	440	454
222	Consumables	0	0	10	31	32	33	34	35	35	38	39
223	Utilities	0	0	52	160	165	170	175	180	185	191	197
224	Technical assistance	0	0	65	250	250	250	250	250	250	250	250
229	SUBTOTAL	0	0	247	810	827	844	862	880	899	919	939
299	TOTAL DIRECT COSTS	0	0	1.387	4.344	4.414	4.712	5.040	5.424	5.842	6.298	6.795
399	INCOME LESS COST OF PRODUCTS SOLD	0	155	1.217	3.055	3.040	3.512	4.006	4.528	5.108	5.751	6.464
400	INDIRECT COSTS											
410	Variable:											
411	Factory supplies	0	0	72	223	229	236	243	251	258	266	274
412	Royalties	0	0	95	296	298	329	362	398	438	482	530
413	Others	0	0	0	0	0	0	0	0	0	0	0
419	SUBTOTAL	0	0	168	519	528	565	605	649	696	748	804
420	Fixed:											
421	Marketing	0	0	128	396	408	420	433	446	459	473	487
422	Administration	0	0	43	132	136	140	144	149	153	158	162
423	Legal Affairs	0	0	43	132	136	140	144	149	153	158	162
424	General Management	0	0	73	225	232	239	246	254	261	269	277
429	SUBTOTAL	0	0	287	885	912	939	967	996	1.026	1.057	1.089
499	TOTAL INDIRECT COSTS	0	0	455	1.404	1.439	1.504	1.573	1.645	1.722	1.805	1.893
599	TOTAL DIRECT AND INDIRECT COSTS	0	0	1.842	5.748	5.854	6.216	6.613	7.069	7.565	8.103	8.688
699	NET INCOME (LOSS)	0	155	762	1.652	1.601	2.007	2.433	2.883	3.385	3.946	4.571
700	OVERHEAD COSTS											
710	Interest long-term debt	0	0	0	807	807	691	576	461	346	230	115
711	Interest medium-term debt	0	0	0	350	280	210	140	70	0	0	0
712	Depreciation	0	0	0	945	945	945	945	870	870	870	870
713	Amortization	0	0	0	856	856	856	856	856	0	0	0
714	Depreciation re-investm.	0	0	0	0	0	0	0	0	50	100	150
799	TOTAL OVERHEAD COSTS	0	0	0	2.958	2.888	2.702	2.517	2.257	1.266	1.200	1.135
899	NET PROFIT	0	155	762	(1.306)	(1.287)	(695)	(84)	626	2.119	2.746	3.436
999	NET PROFIT AFTER TAX	0	155	762	(1.306)	(1.287)	(695)	(84)	626	2.119	2.746	3.436
1999	ACC.NET PROFIT	0	155	918	(389)	(1.676)	(2.371)	(2.454)	(1.828)	291	3.037	6.473
4999	ANN.INVESTMENT OUTLAYS	120	6.533	8.725	800	0	0	0	500	500	500	500
5999	ACC.INVESTMENT OUTLAYS	120	6.653	15.378	16.178	16.178	16.178	16.178	16.678	17.178	17.678	18.178
6999	INTERNAL RATE OF RETURN				-6	-6	-3	0	4	12	16	19
7010	NET PROFIT/NET SALES REV.				-18	-17	-8	-1	6	19	23	26
7020	NET INCOME/NET SALES REV.				22	21	24	27	29	31	33	34
7030	DIRECT COSTS/ NET SALES REVENUE				59	59	57	56	55	53	52	51
7040	INDIRECT COSTS/ NET SALES REVENUE				19	19	18	17	17	16	15	14
7050	VARIABLE COSTS/ NET SALES REVENUE				55	55	54	53	52	51	51	50
7060	FIXED COSTS/ NET SALES REVENUE				39	38	33	28	24	21	18	16

Projected balance sheet and ratios for the fiscal years 1991-2000
Most pessimistic case
(Updated version 1990-10-18)

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
100	CURRENT ASSETS										
110	Cash in hand	8.502	(400)	(2.472)	(2.461)	(3.080)	(3.106)	(3.026)	(2.282)	(422)	2.148
120	Finished goods	0	154	479	488	518	551	589	630	675	724
130	Accounts receivable	0	308	958	976	1.036	1.102	1.178	1.260	1.350	1.448
140	Raw material etc. invent.	0	377	1.169	1.178	1.299	1.429	1.573	1.731	1.904	2.095
150	Deposits	0	0	0	0	0	0	0	0	0	0
199	TOTAL CURRENT ASSETS	8.502	439	134	181	(227)	(24)	314	1.339	3.507	6.415
200	OTHER ASSETS										
210	Establishment costs	120	120	120	120	120	120	120	120	120	120
220	Preoper. expenses	833	2.401	2.401	2.401	2.401	2.401	2.401	2.401	2.401	2.401
240	Interest during construct	600	1.757	1.757	1.757	1.757	1.757	1.757	1.757	1.757	1.757
250	Less: Acc. amortization	0	0	856	1.712	2.568	3.424	4.278	4.278	4.278	4.278
299	NET OTHER ASSETS	1.553	4.278	3.422	2.566	1.710	854	0	0	0	0
300	FIXED ASSETS										
310	Land+site development	700	700	700	700	700	700	700	700	700	700
320	Buildings	2.800	4.300	4.300	4.300	4.300	4.300	4.300	4.300	4.300	4.300
330	Equipment	1.500	5.700	6.500	6.500	6.500	6.500	7.000	7.500	8.000	8.500
340	Office equipment	0	200	200	200	200	200	200	200	200	200
350	Vehicles	100	300	300	300	300	300	300	300	300	300
360	Less: Acc. depreciation	0	0	945	1.890	2.835	3.780	4.650	5.570	6.540	7.560
399	NET FIXED ASSETS	5.100	11.200	11.055	10.110	9.165	8.220	7.850	7.430	6.960	6.440
499	TOTAL ASSETS	15.155	15.917	14.611	12.857	10.648	9.050	8.164	8.769	10.467	12.855

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
500	CURRENT LIABILITIES										
510	Accounts payable	0	0	0	0	0	0	0	0	0	0
520	Short-term borrowings	0	0	0	0	0	0	0	0	0	0
530	Current maturities	0	0	467	1.514	1.514	1.514	1.514	1.048	1.048	1.048
540	Taxes payable	0	0	0	0	0	0	0	0	0	0
550	Dividends payable	0	0	0	0	0	0	0	0	0	0
599	TOTAL CURRENT LIABILITIES	0	0	467	1.514	1.514	1.514	1.514	1.048	1.048	1.048
600	LONG-TERM DEBT										
610	Long-term loans	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400
620	Medium-term loans	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300
630	Less Acc.maturities	0	0	467	1.981	3.495	5.009	6.523	7.571	8.619	9.667
699	NET LONG-TERM DEBT	9.700	9.700	9.233	7.719	6.205	4.691	3.177	2.129	1.081	33
700	SHAREHOLDER'S EQUITY										
710	Common stock	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300
720	Legal reserve	0	0	0	0	0	0	0	0	0	0
730	Acc.profits (losses)	155	918	(389)	(1.676)	(2.371)	(2.454)	(1.828)	291	3.037	6.473
740	Less. Taxes payable	0	0	0	0	0	0	0	0	0	0
750	Less: Dividends payable	0	0	0	0	0	0	0	0	0	0
799	TOTAL EQUITY AND RETAINED EARNINGS	5.455	6.218	4.911	3.624	2.929	2.846	3.472	5.591	8.337	11.773
899	TOTAL LIABILITIES AND SHAREHOLDER'S EQUITY	15.155	15.918	14.611	12.857	10.648	9.051	8.163	8.768	10.466	12.854
910	CURRENT RATIO (2,0-1,2)	-------	-------	0,3	0,1	-0,1	0,0	0,2	1,3	3,3	6,1
920	QUICK RATIO (1,2-1,0)	-------	-------	-3,2	-1,0	-1,4	-1,3	-1,2	-1,0	0,9	3,4
930	LONG-TERM DEBT/ EQUITY + RET.EARN	-------	-------	1,74	1,46	1,17	0,89	0,60	0,40	0,20	0,01
940	SHAREHOLDER'S EQUITY/ TOTAL LIABILITIES	-------	-------	0,36	0,41	0,50	0,59	0,65	0,60	0,51	0,41
950	RETURN ON ASSETS	1	5	4	5	13	22	32	38	38	37
960	TURNOVER RATE OF CAPITAL	-------	0,15	0,51	0,58	0,77	1,00	1,22	1,25	1,15	1,03
	NET SALES	0	2.384	7.400	7.454	8.223	9.046	9.952	10.950	12.048	13.259
	NET PROFIT	155	762	595	614	1.356	1.967	2.602	3.289	3.966	4.706

Projected cash flow statement for fiscal years 1990-2000
Most pessimistic case
(Updated version 1990-10-18)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
100	OPERATIONAL CASH-FLOW											
110	Net incocme/lose	0	155	762	1.652	1.601	2.007	2.433	2.883	3.385	3.946	4.571
120	Less:Interest	0	0	0	1.157	1.087	901	716	531	346	230	115
130	Less: Increase Prod+RM+PM	0	0	531	1.117	18	151	163	182	199	218	240
140	Less: Increase Acc.Rec.	0	0	308	650	18	60	66	76	82	90	98
150	Increase Acc.Payable	0	0	0	0	0	0	0	0	0	0	0
160	Less: Additional assets	120	6.533	8.825	800	0	0	0	500	500	500	500
	(Preoperational expenses)	120	833	1.568								
	(Civil works)	0	2.600	2.400								
	(Modules)	0	2.500	3.700	800	0	0	0	500	500	500	500
	(Interest during constr.)	0	600	1.157								
199	Total op. cash-flow	(120)	(6.378)	(8.902)	(2.072)	478	895	1.488	1.594	2.258	2.908	3.618

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
200	FINANCIAL CASH-FLOW											
210	Increase in equity	0	5.300	0	0	0	0	0	0	0	0	0
220	Long/medium-term loans	0	9.700	0	0	0	0	0	0	0	0	0
230	Less: Loan repayments	0	0	0	0	467	1.514	1.514	1.514	1.514	1.048	1.048
299	Total fin. cash-flow	0	15.000	0	0	(467)	(1.514)	(1.514)	(1.514)	(1.514)	(1.048)	(1.048)
399	CHANGE IN CASH	(120)	8.622	(8.902)	(2.072)	11	(619)	(26)	80	744	1.860	2.570
499	ACC.CHANGE IN CASH	(120)	8.502	(400)	(2.472)	(2.461)	(3.080)	(3.106)	(3.026)	(2.282)	(422)	2.148
599	Discount factor 20 %	1,44	1,2	1	0,83	0,69	0,58	0,48	0,4	0,33	0,28	0,23
699	DISC.NET CASH FLOW	(173)	10.346	(8.902)	(1.720)	8	(359)	(12)	32	246	521	591
799	ACC.NET CASH FLOW			577								

Business (1000 USD + 10SD) Cash-Flow Projection
(Updated version 1990-10-18)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
100	REVENUE											
110	Sales revenue	0	0	3.144	10.000	11.658	13.989	17.956	25.398	31.050	34.164	37.596
120	Less: Opening inventory	0	0	0	262	830	880	970	1.070	1.180	1.294	1.424
130	Add: Closing inventory	0	0	262	830	880	970	1.070	1.180	1.294	1.424	1.567
140	Others	0	0	0	0	0	0	0	0	0	0	0
199	NET SALES REVENUE	0	0	3.406	10.568	11.708	14.079	18.056	25.508	31.164	34.294	37.739
009	AGENCY COMMISSION	0	222	314	0	0	0	0	0	0	0	0
200	DIRECT COSTS											
210	Variable:											
211	Raw materials	0	0	429	1.332	1.475	1.774	2.275	3.214	3.927	4.321	4.755
212	Packaging materials	0	0	647	2.008	2.225	2.675	3.431	4.847	5.921	6.516	7.170
213	Wages in production	0	0	277	855	965	1.093	1.353	2.303	2.302	2.491	2.695
214	Consumables	0	0	61	188	212	239	387	412	497	537	582
215	Utilities	0	0	117	364	412	468	582	821	994	1.076	1.165
216	Others	0	0	0	0	0	0	0	0	0	0	0
219	SUBTOTAL	0	0	1.531	4.746	5.289	6.249	8.028	11.597	13.641	14.941	16.368
220	Fixed:											
221	Salaries (QC,MA)	0	0	141	434	479	530	628	827	969	1.030	1.098
222	Consumables	0	0	12	37	38	39	40	42	43	44	46
223	Utilities	0	0	61	188	212	239	292	404	482	514	551
224	Technical assistance	0	0	65	250	250	250	250	250	250	250	250
229	SUBTOTAL	0	0	279	909	979	1.058	1.210	1.523	1.744	1.838	1.945
299	TOTAL DIRECT COSTS	0	0	1.810	5.655	6.268	7.307	9.238	13.120	15.385	16.779	18.313
399	INCOME LESS COST OF PRODUCTS SOLD	0	222	1.910	4.913	5.440	6.772	8.818	12.388	15.779	17.515	19.426
400	INDIRECT COSTS											
410	Variable:											
411	Factory supplies	0	0	85	262	290	322	383	509	599	638	679
412	Royalties	0	0	136	423	468	563	722	1.020	1.247	1.372	1.510
413	Others	0	0	0	0	0	0	0	0	0	0	0
419	SUBTOTAL	0	0	221	685	758	885	1.105	1.529	1.846	2.010	2.189
420	Fixed:											
421	Marketing	0	0	128	396	482	583	792	1.236	1.546	1.669	1.803
422	Administration	0	0	43	132	136	140	144	149	153	158	163
423	Legal Affairs	0	0	43	132	136	140	144	149	153	158	163
424	General Management	0	0	73	225	232	239	246	253	261	269	277
429	SUBTOTAL	0	0	287	885	986	1.102	1.326	1.787	2.113	2.254	2.406
499	TOTAL INDIRECT COSTS	0	0	508	1.570	1.744	1.987	2.431	3.316	3.959	4.264	4.595
599	TOTAL DIRECT AND INDIRECT COSTS	0	0	2.319	7.225	8.012	9.294	11.669	16.436	19.343	21.043	22.907
	NET INCOME (LOSS)	0	222	1.401	3.343	3.696	4.785	6.387	9.072	11.821	13.251	14.832
700	OVERHEAD COSTS											
710	Interest long-term debt	0	0	0	807	807	691	576	461	346	230	115
711	Interest medium-term debt	0	0	0	350	280	210	140	70	0	0	0
712	Depreciation	0	0	0	945	945	945	945	870	1.270	1.270	1.270
713	Amortization	0	0	0	856	856	856	856	856	0	0	0
714	Depreciation re-invests.	0	0	0	0	0	0	50	150	250	350	450
799	TOTAL OVERHEAD COSTS	0	0	0	2.958	2.888	2.702	2.567	2.407	1.866	1.850	1.835
899	NET PROFIT	0	222	1.401	385	808	2.083	3.820	6.665	9.955	11.401	12.997
999	NET PROFIT AFTER TAX	0	222	1.401	385	808	2.083	3.820	6.665	9.955	11.401	12.997
1999	ACC.NET PROFIT	0	222	1.623	2.008	2.816	4.899	8.719	15.384	25.339	36.740	49.737
6010	ANNUAL INVESTMENT OUTLAYS	120	6.533	8.725	800	0	500	1.000	6.000	1.000	1.000	1.000
6020	ACC.INVESTMENT OUTLAYS	120	6.653	15.378	16.178	16.178	16.678	17.678	23.678	24.678	25.678	26.678
6030	INTERN. RATE OF RETURN %				8,2	10,8	18,2	27,0	31,8	45,5	49,3	53,5
7010	NET PROFIT/NET SALES REV.				4	7	15	21	26	32	33	34
7020	NET INCOME/NET SALES REV.				32	32	34	35	36	38	39	39
7030	DIRECT COSTS/ NET SALES REVENUE				54	54	52	51	51	49	49	49
7040	INDIRECT COSTS/ NET SALES REVENUE				15	15	14	13	13	13	12	12
7050	VARIABLE COSTS/ NET SALES REVENUE				51	52	51	51	51	50	49	49
7060	FIXED COSTS/ NET SALES REVENUE				28	26	22	18	15	13	13	12

Projected balance sheet and ratios for the fiscal years 1991-2000
Most optimistic case
(Updated version 1993-10-18)

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
100	CURRENT ASSETS										
110	Cash in hand	8.569	28	(945)	819	1.993	4.031	2.586	9.928	19.980	31.640
120	Finished goods	0	193	602	668	775	972	1.370	1.612	1.754	1.909
130	Accounts receivable	0	386	1.204	1.336	1.550	1.944	2.740	3.224	3.508	3.818
140	Raw material etc. invent.	0	538	1.670	1.850	2.225	2.753	4.031	4.924	5.419	5.963
150	Deposits	0	0	0	0	0	0	0	0	0	0
199	TOTAL CURRENT ASSETS	8.569	1.145	2.531	4.673	6.543	9.700	10.727	19.688	30.661	43.330
200	OTHER ASSETS										
210	Establishment costs	120	120	120	120	120	120	120	120	120	120
220	Preoper. expenses	833	2.401	2.401	2.401	2.401	2.401	2.401	2.401	2.401	2.401
240	Interest during construct	600	1.757	1.757	1.757	1.757	1.757	1.757	1.757	1.757	1.757
250	Less: Acc. amortization	0	0	856	1.712	2.568	3.424	4.278	4.278	4.278	4.278
299	NET OTHER ASSETS	1.553	4.278	3.422	2.566	1.710	854	0	0	0	0
300	FIXED ASSETS										
310	Land+site development	700	700	700	700	700	700	700	700	700	700
320	Buildings	2.800	4.300	4.300	4.300	4.300	4.300	5.800	5.800	5.800	5.800
330	Equipment	1.500	5.700	6.500	6.500	7.000	8.000	12.500	13.500	14.500	15.500
340	Office equipment	0	200	200	200	200	200	200	200	200	200
350	Vehicles	100	300	300	300	300	300	300	300	300	300
360	Less: Acc. depreciation	0	0	945	1.890	2.835	3.830	4.850	6.370	7.990	9.710
399	NET FIXED ASSETS	5.100	11.200	11.055	10.110	9.665	9.670	14.650	14.130	13.510	12.790
499.	TOTAL ASSETS	15.222	16.623	17.008	17.349	17.918	20.224	25.377	33.818	44.171	56.120

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
500	CURRENT LIABILITIES										
510	Accounts payable	0	0	0	0	0	0	0	0	0	0
520	Short-term borrowings	0	0	0	0	0	0	0	0	0	0
530	Current maturities	0	0	467	1.514	1.514	1.514	1.514	1.048	1.048	1.048
540	Taxes payable	0	0	0	0	0	0	0	0	0	0
550	Dividends payable	0	0	0	0	0	0	0	0	0	0
599	TOTAL CURRENT LIABILITIES	0	0	467	1.514	1.514	1.514	1.514	1.048	1.048	1.048
600	LONG-TERM DEBT										
610	Long-term loans	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400	7.400
620	Medium-term loans	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300	2.300
630	Less Acc.maturities	0	0	467	1.981	3.495	5.009	6.523	7.571	8.619	9.667
699	NET LONG-TERM DEBT	9.700	9.700	9.233	7.719	6.205	4.691	3.177	2.129	1.081	33
700	SHAREHOLDER'S EQUITY										
710	Common stock	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300	5.300
720	Legal reserve	0	0	0	0	0	0	0	0	0	0
730	Acc.profits (losses)	222	1.623	2.008	2.816	4.899	8.719	15.384	25.339	36.740	49.737
740	Less. Taxes payable	0	0	0	0	0	0	0	0	0	0
750	Less: Dividends payable	0	0	0	0	0	0	0	0	0	0
799	TOTAL EQUITY AND RETAINED EARNINGS	5.522	6.923	7.308	8.116	10.199	14.019	20.684	30.639	42.040	55.037
899	TOTAL LIABILITIES AND SHAREHOLDER'S EQUITY	15.222	16.623	17.008	17.349	17.918	20.224	25.375	33.816	44.169	56.118
910	CURRENT RATIO (2,0-1,2)	-------	-------	5,4	3,1	4,3	6,4	7,1	18,8	29,3	41,3
920	QUICK RATIO (1,2-1,0)	-------	-------	0,6	1,4	2,3	3,9	3,5	12,5	22,4	33,8
930	LONG-TERM DEBT/ EQUITY + RET.EARN	-------	-------	1,74	1,46	1,17	0,89	0,60	0,40	0,20	0,01
940	SHAREHOLDER'S EQUITY/ TOTAL LIABILITIES	-------	-------	0,31	0,31	0,30	0,26	0,21	0,16	0,12	0,09
950	RETURN ON ASSETS	1	5	3	4	8	10	10	10	9	8
960	TURNOVER RATE OF CAPITAL	-------	0,14	0,44	0,43	0,46	0,45	0,39	0,32	0,27	0,24

Projected cash flow statement for fiscal years 1990-2000
Most optimistic case
(Updated version 1990-10-18)

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
100	OPERATIONAL CASH-FLOW											
110	Net incocme/loss	0	222	1.401	3.343	3.696	4.785	6.387	9.072	11.821	13.251	14.832
120	Less:Interest	0	0	0	1.157	1.087	901	716	531	346	230	115
130	Less: Increase Prod+RM+PM	0	0	731	1.541	246	482	725	1.676	1.135	637	699
140	Less: Increase Acc.Rec.	0	0	386	818	132	214	394	796	484	284	310
150	Increase Acc.Payable	0	0	0	0	0	0	0	0	0	0	0
160	Less: Additional assets	0	6.653	8.825	800	0	500	1.000	6.000	1.000	1.000	1.000
	(Preoperational expenses)	120	833	1.568								
	(Civil works)	0	2.600	2.400								
	(Modules)	0	2.500	3.700	800	0	500	1000	6000	1000	1000	1000
	(Interest during constr.)	0	600	1.157								
199	Total op. cash-flow	0	(6.431)	(8.541)	(973)	2.231	2.688	3.552	69	8.856	11.100	12.708

		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
200	FINANCIAL CASH-FLOW											
210	Increase in equity	0	5.300	0	0	0	0	0	0	0	0	0
220	Long/medium-term loans	0	9.700	0	0	0	0	0	0	0	0	0
230	Less: Loan repayments	0	0	0	0	467	1.514	1.514	1.514	1.514	1.048	1.048
299	Total fin. cash-flow	0	15.000	0	0	(467)	(1.514)	(1.514)	(1.514)	(1.514)	(1.048)	(1.048)
399	CHANGE IN CASH	0	8.569	(8.541)	(973)	1.764	1.174	2.038	(1.445)	7.342	10.052	11.660
499	ACC.CHANGE IN CASH	0	8.569	28	(945)	819	1.993	4.031	2.586	9.928	19.980	31.640
599	Discount factor 20 %	1,44	1,2	1	0,83	0,69	0,58	0,48	0 4	0,33	0,28	0,23
699	DISC.NET CASH FLOW	0	10.283	(8.541)	(808)	1.217	681	978	(578)	2.423	2.815	2.682
799	ACC.NET CASH FLOW			11.152								

Sources for financing the investment.Reimbursement and other conditions of the financing.

The financing of the investment is assumed to be the following:

	tUSD	Duration	Grace period	Interest rate
		*	*	*
Equity	5300	N.A.	N.A.	N.A.
Long-term loans	7400	10 years	3 years	11 %
Medium-term loans	2300	7 years	2 years	15 %

* Not Applicable

The repayment schedule for the medium-term credit is thus assumed to be the following:

Year	Principal tUSD	Annuities tUSD	Interests tUSD	Total payments tUSD
1991	2300	-	180(*)	180
1992	2300	-	350	350
1993	2300	460	350	810
1994	1840	460	280	740
1995	1380	460	210	670
1996	920	460	140	600
1997	460	460	70	530
1998	-	-	-	-
1999	-	-	-	-
2000	-	-	-	-
TOTAL	-	2300	1580	3880

(*) Half year 1991

The repayment schedule for the long-term credit is thus assumed to be the following:

Year	Principal tUSD	Annuities tUSD	Interests tUSD	Total payments tUSD
1991	7400	-	420(*)	420
1992	7400	-	807	807
1993	7740	-	807	807
1994	7400	1057	807	1864
1995	6343	1057	691	1748
1996	5286	1057	576	1633
1997	4229	1057	461	1518
1998	3172	1057	346	1403
1999	2115	1057	230	1287
2000	1058	1057	115	1173
TOTAL	-	7400	5260	12660

(*) half year 1991

The repayment schedule for the combined credits is thus the following:

Year	Principal tUSD	Annuities tUSD	Interests tUSD	Total payments tUSD
1991	9700	-	600(*)	600
1992	9700	-	1157	1157
1993	9700	460	1157	11617
1994	9240	1517	1087	2604
1995	7723	1517	901	2418
1996	6206	1517	716	2233
1997	4689	1517	531	2048
1998	3172	1057	346	1403
1999	2115	1057	230	1287
2000	1058	1057	115	1173
TOTAL	-	9700	6840	16540

(*) half year 1991

NOTE:

In 1993 the "Most realistic case" and the "Most optimistic case" will require either change of credit conditins for RM+PM or short-term borrowing in the range of 1 mUSD. Collaterals and/or more equity may be required.

Feasibility study for production of pharmaceutical preparations in Cameroon.

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Pharmadule

1987 10 08

The PHARMADULE concept

A superior, safe and rational way to establish low budget pharmaceutical plants and laboratories in the third world. Most of the obvious advantages with the Pharmadule concept are also valid for projects in the industrialized world.

Background

During our earlier work within the Swedish pharmaceutical industry we were involved in many conventional pharmaceutical projects in the third world. In these projects we gained the experience that no matter how well planned and organized they were, things often went wrong:

- The time schedule planned could not be kept.
- The expected implementation costs were substantially increased.
- The estimated production capacity could never be obtained.
- The total project budget had been much too optimistic and important local factors had not been included in the estimate.
- The occurrence of unforeseen technical problems during installation, test runs and running-in of the plant.

In other words, the outcome of the projects were many times disastrous. When this was discussed with colleagues also involved in technology transfer, but working for other Swedish or international pharmaceutical companies, they all had very much the same experiences. For this reason we decided to find a better solution. When we identified the problems they were in most cases related to:

- Inexperienced local builders.
- Lack of suitable building materials.
- Insufficient local experience in the pharmaceutical field.
- Local bureaucratic disturbances.
- Problems in receiving 4.711 different parts at the right time, get them through customs, transport them safely to the site, and then install them in a proper way etc.
- Difficulty in putting together the best possible project organizations at reasonable costs for work far away from home during a long period of time.

- Employees who are taken from their regular work in a sophisticated pharmaceutical industry will have little experience or understanding of the needs in the third world and may have a tendency to make the project more technologically complicated and expensive than necessary.

The concept

We found the solution to most of the problems above when we combined our knowledge in the pharmaceutical field with the know-how about the modular techniques used in the off-shore industry.

In the off-shore industry they have made high technology modules for more than 15 years. Modules that are easy to handle, disassemble and put together again. Modules that are very robust and suited for almost any kind of climatic conditions. They are also made to withstand extreme cold, heat, damp, corrosion from salt water, heavy loads and an unusually high degree of wear and tear.

If you look at a conventional pharmaceutical factory you will note that the largest part of the plant is used for administration and storage. Buildings that create little problems to build locally. Only a small part of the total plant will be used for the processes, utilities and the laboratory. At the same time, these parts of the plant are the ones that determine if a project will be a success or not. If these small parts of the total plant are made complete in modules of the same kind as these used in the off-shore industry, it will be possible to do the main work in Sweden, "in your own yard". In this way we will have easy access to skilled engineers and pharmacists and it will be possible to install, test and validate the plant before delivery. It will also be possible to perform inspections by our Ministry of Health´s drug inspectors who will issue a certificate which states that the units fulfil WHO or FDA´s regulations. This technique furthermore ensures that the units will function properly when they arrive at the site and the running/in period can be cut down to a minimum. The units can after approval be disassembled into modules and transported as containers to the site with all equipment in place. At the site they are placed on a simple foundation and are docked to the locally built warehouse. To save costs it is also possible to use an already existing building for this purpose.

The advantages

Through the combination of our knowledge and the know-how with the modular technique from the off-shore industry, the following main advantages are obvious:

- The buildings for the processes, utilities and laboratory will be of high quality, long lasting, fulfil relevant GMP regulations and require a minimum of maintenance.

- A safe function and capacity can be guaranteed.

- A fast and rational construction at our own premises ensures an exceptionally short total project time.

- A low and fixed total price. There will be no unpleasent surprises during the implementation phase.

- Simple stepwise extensions make it possible to continuously work with the right capacity and adjust the investment to the present economic situation.

In our concept we can also include all the necessary software and documentation for a successful operation, e.g. instructions, master files for most of the essential drugs, training and education programmes, selection of products, quality control methods etc. A software programme will in each project be tailor-made to the client s needs.

We can supply our customers with after sales services, such as management support, consulting and maintenance services or help to find suitable raw material suppliers.

To make our concept complete we furthermore offer production units for PVC bags, plastic jars and bottles, needles, syringes and administration sets. An own production may cut down the total cost for the use of pharmaceuticals, as these parts also have to be supplied in the total system.

Our experience is that many complications follow when a client wants to start up on a too large scale. Through our concept it will be possible for third world companies to start small embryos to pharmaceutical plants at a limited cost. These embryos can then later on when more experience has been obtained and through successful and profitable operations, be expanded step by step through the addition of further modules. In this way a fairly large industry can be built.

Another thing in our favour in comparison with conventional suppliers, is the fact that they tend to overcalculate the cost of a project. This has to be done in order to compensate for the insecurity about the final outcome as they are unfamiliar with the local conditions. This insecurity cost in combination with the costs for the large amount of engineers and supervisors that have to be sent to the site as well as transportation costs for each single piece, will in fact, in most cases, exceed the cost of our naked modules. This means that the total cost of the project in exchangeable currency will not be less if the modules for the processes, utilities and laboratory are left out and local houses are constructed instead. Furthermore, many of the advantages with our system will then be lost.

As our modules are transportable, this also means that we can let a customer have the units on a leasing basis. This makes it possible to spread the investment costs over 5-7 years and let the profit from the operations pay the investment.

In this alternative, the client or a foreign aid organization, instead of paying all the costs for a plant during the implementation, issues a bank guarantee for the leasing contract. The leasing costs will then be paid primarily through the successful operation of the plant or through the saving of exchangeable currency as less pharmaceuticals have to be imported. After 5-7 years the plant will against a small final payment be owned by the client. The most important advantage with the leasing concept is the fact that since only bank guarantees have to be made less cash money will be required and several projects can be supported instead of one. It is also our belief that the client will have an even larger interest in doing a good job and be more concerned with the maintenance of the plant under these conditions.

Pharmadule is an independent company and is not owned by any pharmaceutical company or equipment manufacturer. This means that we can work with any other party without restrictions and can look at everything absolutely objectively. For the same reason we can work confidentially together with all pharmaceutical companies when that is required. If, on the other hand, support from or cooperation with Scandinavian or other pharmaceutical companies is wanted by our client, that is also possible as Pharmadule has a good reputation and relation to most companies.

Our company futhermore has strong support from the authorities. We cooperate both with the Swedish National Board of Health and Welfare, Department of Drugs and the Committee for International Cooperation on Pharmaceuticals. The latter is a committee within our Ministry of Health and Social Affairs.

Summary

Our concept is based on many years of experience from conventional international pharmaceutical projects. By using the modular technique, most of the problems that frequently occur in conventional projects can be avoided. Our modular concept ensures a successful operation within the planned time frame, with the promised capacity and without any cost overruns.

Pharmadule

THE ADVANTAGES OF THE PHARMADULE SYSTEM

GENERAL

Many years of experience have taught us that problems are frequent at the implementation of pharmaceutical, biotechnical and related projects. This experience has been used to develop the PHARMADULE concept. The concept offers a successful way to eliminate most problems and will at the same time incorporate a wide range of advantages. The main advantages concerns economy, building technique and safety in project implementation. Some of these advantages have been summarized below.

ECONOMY

Short project time. An exceptionally short project implementation time from project start to full production. In most cases less than half the time is required in comparison with the conventional alternative, which means that a PHARMADULE project in many cases has reached break even before a conventional project has even started to generate money. The delivery time is also fixed and no business opportunities will be lost depending on otherwise common time delays.

Low investment cost. The investment will in almost all cases be less than in a similar conventional project. This is depending on a very rational construction and implementation technique. Furthermore, as a PHARMADULE project can be better monitored, a low profit margin can be kept without addition of a large percentage for unpredicted extra costs. The costs for necessary foreign technical assistance at the site can also be kept at a minimum.

Low module cost. The cost of a qualified area is less in modules than in conventional buildings of similar quality.

Fixed price. There will be no unpleasant surprises in a PHARMADULE project as everything that is necessary for a successful operation, hardware as well as software, is included. Cost overruns, depending on unforeseen technical difficulties which are normal in conventional projects, will not occur.

Stepwise investment. Capacity or plant area can be increased stepwise through simple and inexpensive addition of further modules which is prepared for. It is very costly to build for the coming 10 years, as in conventional projects, and then utilize only a fraction of the capacity for many years. The sales over many years is difficult to predict and can also easily be over estimated. In a PHARMADULE project it will only be necessary to foresee what is needed during the next couple of years.

Maintenance cost at a minimum. As the modules are of high quality and intended for the worst climatic conditions, a minimum of maintenance will be required. Only reliable equipment from internationally well reputed suppliers will be included in the PHARMADULE units. However, the client's preferences concerning equipment as well as the availability of local service organizations will be considered in each project.

Cost effective and rational. PHARMADULE's units will be planned for the best performance and an effective utilization of available space. This will reduce both the operational and total project costs. As the modules are well insulated, energy costs can also be saved.

Low cost of foundation and ground works. The foundation can be simple and inexpensive. Only a few concrete plinths will be necessary and connections for water, drain and electricity.

Foreign cost element can be kept low. The foreign cost element in a project can be kept at a minimum, which not only depends on a low total investment cost. E.g. some of the construction work can be made by local personnel and building materials. It is important to state that in third world projects the required amount of foreign currency can, if a conventional project implementation is chosen, be less only if important factors are missing or the quality is drastically reduced. In most cases, even if a local building for the total project is available, this will not cause a reduction in costs as most of the other PHARMADULE advantages then will be lost. The cost of the naked modules are also normally only 10 percent of the project cost. Thus nothing can be saved by excluding them as other factors will increase proportionally more.

Local buildings can be used. Buildings for less critical areas as e.g. warehouse and administration can be built locally. To save the initial project costs, as an alternative, already existing buildings suitable for the purpose can be bought or rented. If a new warehouse is constructed later, e.g. depending on an increased need of storage area, it will be possible to move the PHARMADULE units to the new location and save the cost also of rebuilding the areas for production, utilities and laboratory.

Flexibility in business development. Availability of ready specifications for a wide range of different modular units and access to PHARMADULE know how offers great advantages to our clients in case there are interests in future developments into new fields.

Management support. PHARMADULE can offer assistance to overcome temporary management problems and suggest ways out, in critical situations.

Product development. PHARMADULE can help the clients with process and product development, which means that less money have to be invested in research and development.

Feasibility studies. To ensure a future profitable operation PHARMADULE can perform feasibility studies at a low cost. The cost of the study will be deducted from the project cost if the project is implemented.

Unconventional financing. PHARMADULE can offer units on a leasing basis i.e. that the cost of the project can be paid from the profit of the production. Thus the initial investment can be brought down to a minimum. PHARMADULE also has good connections with barter companies and foreign aid organizations to facilitate financing in third world projects.

Raw material support. In order to give the client access to raw materials of suitable quality at a low cost, PHARMADULE can, in most cases, suggest suitable suppliers. This is especially important for small, newly established industries which buys raw materials in small quantities at high costs. Through good connections PHARMADULE in many cases will be able to get a discount for its clients. Certified raw materials can also be supplied.

Quality control cost reduction. Through a Swedish governmental test laboratory PHARMADULE can offer quality control of the products in pharmaceutical projects. In this way it will be possible to exclude the investment of a fully equipped laboratory from the first phase of a project.

Product selection. PHARMADULE can offer guidance concerning product selection through a well developed cooperation with the Swedish Board of Health and Welfare, Department of Drugs, which closely follows local needs, product trends and todays drugs of choice.

Reduced risk of losses in uncertain projects. If the outcome of an investment in a new process line or a new market is uncertain, it will be much safer to invest in a small scale production unit and then expand later, when the profitability is proved. If the investment would not be successful, the unit will still have a value and can be moved to another location or sold. PHARMADULE may also assist at the resale of a used unit.

Market tests. PHARMADULE can in many cases be helpful with products for a test sale and help the client to establish a market before extensions into new fields are made.

Increased export possibilities. In many countries a certification of the plant and regular inspections from the Swedish National Board of Health and Welfare will increase the prestige and thus possibilities for export and sales at a good price level. Export to other countries may also be simplified.

Agentship. PHARMADULE can in many cases through good relations be helpful with arrangement of agentship for prestigious, pharmaceutical companies. In connection with projects this opportunity may finance the investment.

Licences. Well reputed and prestigious companies require a reasonable GMP standard of the facilities to give licences for their products. PHARMADULE can make pharmaceutical facilities in modules very fast, which complies with their demands.

Production programme. PHARMADULE can offer documentation for a wide range of products in connection with modular projects. Through good relations, with several pharmaceutical companies, licence agreements can also be offered. PHARMADULE can in each project tailormake a production programme that fits the needs of the client and ensures a good profitability.

No production stop during renovation. No loss in sales is necessary during a renovation phase as the production may continue in PHARMADULE modules while the area is under reconstruction.

Diversification. The authorities are in many countries setting the prices of pharmaceuticals. The authorities are often slow at allowing the manufacturers to get compensation for inflation and other increases in costs of the production. To have a second leg to rely on makes the pharmaceutical companies less sensitive. Another closely related production that has less restrictions is then suitable. PHARMADULE can offer several alternatives e.g. a cosmetic plant complete with a wide variety of products, documentation, marketing material etc.

BUILDING AND CONSTRUCTION

Rational and quick construction. The construciton is made indoors according to procedures developed by the off shore industry. A naked module can be constructed in about 4 weeks time.

Strong and rational construction in steel. The modules have been constructed, insulated and the surfaces treated to withstand the worst weather conditions and more than normal wear and tear. Heavy equipment may be installed inside without complications during transport, lifts or assemblage. Sensitive equipment will be well protected inside the module. The PHARMADULE modules may under no circumstances be compared with regular containers or barracks, as the quality and durability of the PHARMADULE modules are equal or better than for conventional buildings.

Simple transportation. The modules can, however, be transported and handled like ordinary containers.

Interior of good quality. The interior is made of durable and hygienic materials. In the clean areas resistant and non porous welded PVC carpets on floors and walls are chosen.

Concealed piping and ducting. Pipes and ducts are mainly concealed in order to obtain the best hygienic conditions in the facilities.

Utilities are included. Complete air conditioning with proper filters, etc. is included as well as equipment for water treatment, i.e. deionizers, filters, distillation units etc. Other examples are equipment for compressed air, water cooling, steam, generation, electricity and vacuum pumps.

For stationary or temporary usage. The modules can be used for stationary as well as temporary purposes. It will always be possible to move the modules to another site. Mobile units can be made for special purposes e.g. small units for the production of sterile solutions during times of war or isolation.

Fits easily together. The modules are made to fit easily together with all equipment in place. Piping, ducting and electrical cables are easily connected between the modules according to a special system.

Well insulated. The modules are well insulated, which saves energy.

Matching facade. The facade can be made in any material, painted steel, wood, aluminium, even bricks etc. In most cases a smart design is chosen in cooperation with the client's architect. The design of the module and facade can be made to match the surrounding buildings.

Prepared for extensions. Most of the modular units are prepared for extensions i.e. that piping, ducting. electrical cables, utilities capacity etc are pepared for an increased production and does not need to be changed. Closed segments can be opened to allow installation of e.g. new filling machines, mixing tanks or other large machinery. Entrances between existing and additional modules are also prepared for. The module layout is prepared for quick extensions which means that the time for production stop to install the new equipment can be kept to a minimum.

Simple foundation. Only a simple foundation will be necessary e.g. 4-6 concrete plinths for each module is sufficient in most cases.

Simple connection to services. Connection to electricity and municipal water is prepared for as well as the drainage system. PHARMADULE will give instructions about location of connections, dimensions, necessary water capacity and quality, electrical need with maximum allowed voltage variation etc. to the local builder.

Layout of connecting buildings. PHARMADULE can also take care of the building & construction of the connecting houses but in most cases these parts of the project are taken care of by the client. PHARMADULE, however, gives necessary information about layout, space requirements and construction.

Flexibility. The PHARMADULE modules can be made to any practical size and be tailormade for the needs of the client.

Equipment installation. Installation of equipment is made by the suppliers in cooperation with a group of specially trained personnel that are used to work with sophisticated technological projects. The best possible tools are also used for the installations which ensures a good function and a long life span of the equipment.

Location indoors. The modules can also be placed indoors e.g. in a warehouse or other suitable building. In this case reductions in insulation and other costs can be made.

Pharmadule

Anticorrosion treated. As the modules are made to withstand salty and humid air, they are specially treated with several layers of anticorrosives and paint.

Option flexibility. As options e.g special units with diesel generator, steam boiler, crude water purification or waste water treatment for destruction of harmful substances can be offered.

SAFETY AND SECURITY

Test run before delivery. The PHARMADULE units are tested and validated before delivery. The risk of malfunction and problems at the final site are greatly reduced. This frequently causes long, costly delays in conventional projects.

Capability guarantee. The quality of the unit as well as production is guaranteed. The intended capacity of the production units will also be guaranteed.

Inspection. The PHARMADULE units will be inspected by drug inspectors from the Swedish Board of Health and Welfare before delivery. A certificate will accompany the modules which states that the modules fulfils the regulations in GMP from WHO, DHSS or FDA or other authorities.

Supervision at the site. The PHARMADULE personnel do not leave the site before the unit is in full operation according to set specifications.

Reduced risk for damage or loss of equipment. As all the equipment is included in large, strong and sealed modules at the transportation the chance of damage, theft or misplacement will be greatly reduced.

Bureaucratic disturbances. This kind of common disturbances can be reduced as the units are complete and arrives at one instant and not as in conventional projects, in many small lots. E.g. the custom clearance can be greatly facilitated.

Independent. PHARMADULE is not owned by any pharmaceutical manufacturer or equipment supplier. This ensures that PHARMADULE can act objectively in each project and suggest solutions which always will be in the interest of the customer. PHARMADULE's independence also guarantees a confidential handling of each project.

Back up. PHARMADULE will serve as a back up facility for its clients E.g. technical service and maintenance of the modules, consultancy services, product development, education and training programmes can be offered. PHARMADULE does not leave its customers just because a project is ready. PHARMADULE aims to always be there to assist its clients to successful production in the long run.
PHARMADULE's business philosophy is to create facilities which are easy to expand. This means that PHARMADULE has to take care of its customers especially well as otherwise expansions are less likely or will be delayed. In other words, PHARMADULE shares the interest of its customers to have successful and prosperous projects. This fact ensures that PHARMADULE will do its utmost to have satisfied customers.

The Pharmadule Way: a complete system

Pharmadule offers complete systems with all components needed for the successful outcome of pharmaceutical and biotechnical projects. The modular factory or laboratory is the hardware, while the software includes education and training, process documentation and general technical support. The Pharmadule way is a clear winner over conventional project and construction methods.

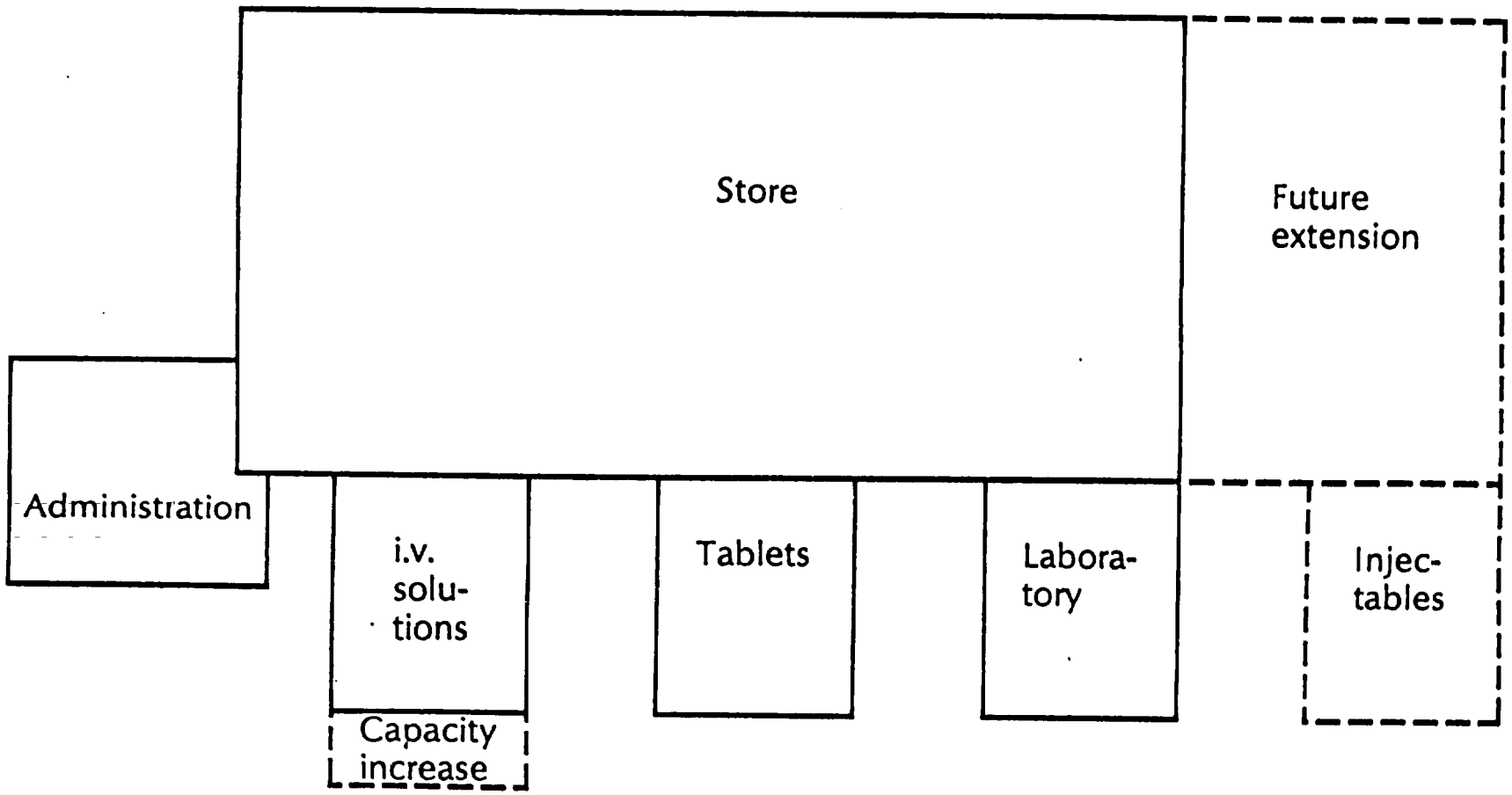
The clear winner

Comparison of Pharmadule with conventional projects

	Pharmadule	Conventional
Average implementation time	6 – 18 months	18 months – 4 years
Delivery	Fixed delivery time	High risk for delay
Capital costs	– Similar –	– Similar –
Final cost	Fixed quoted price	Cost overrun usual
Expansion facilities	Prepared for simple future expansion	Seldom prepared
GMP and GLP compliance	Meets international standards*	Seldom achieved in developing countries
After-sales service	Full support and assistance, even after project completion	After-sales assistance often non-existent
Education and training	Customer training at the actual plant included in concept	Must be arranged at separate location
Pre-delivery testing	Included in concept, for fast start-up at the site	Not possible
Quality and capacity	Guaranteed	Uncertain
Leasing facilities	Leasing and stepwise payment possible	Normally not possible
Documentation	Operation procedures and instruction manuals included	Often missing or inadequate
License production	Quality standards and GMP compliance acceptable to licensors	Local construction in developing countries seldom acceptable to licensors
Mobility	Easily relocated	Fixed
Bureaucracy	One international contact (Pharmadule)	Many separate suppliers
Logistics	Complete system delivered in one shipment, in sealed robust modules	Separate handling of many shipments, with risk for damages and theft

* *Pharmadule plants are inspected and certified by the Swedish Drug Inspectorate, and fulfil international GMP standards. Yearly re-inspections can be arranged by Pharmadule to ensure that standards are maintained.*

FLEXIBILITY

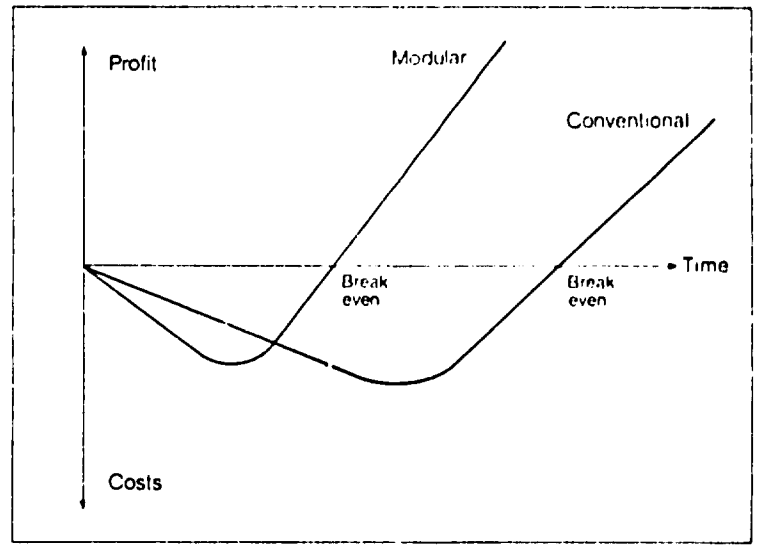


Improved cash flow
Better economy
Stronger market position

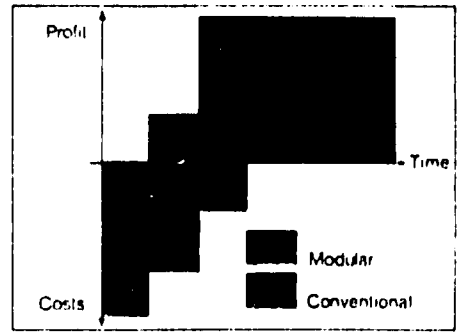
The short time between planning and start of operation with Pharmadule's modular plants gives quick cash flow returns. Modular plants mean lower interest payments on loans, less depreciation as a result of inflation, earlier returns on investment plus a quicker income from interest on capital. In equivalent conventional projects, with their longer start-up time, costs and lost profits are considerable and income can never catch up with a modular plant. To put it another way, a Pharmadule project can afford up to twice as much investment as a conventional plant and still attain similar profitability.

Fast turnaround between planning and production is often decisive in establishing a market position. A Pharmadule plant can gain a major share in a new market while the conventional competitors are still in the construction phase. Existing modular factories can be rapidly adapted to changing market demands with a minimum of additional investment. For conventional projects, the time and cost thresholds for expansion are often so high that valuable market opportunities are lost.

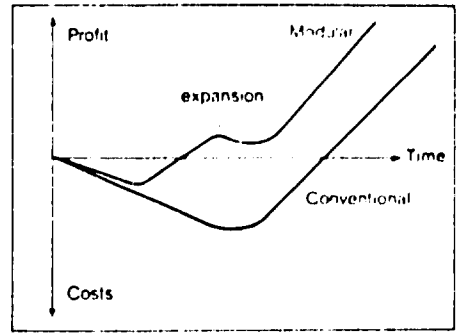
For developing countries, rapid domestic production brings earlier independence from imported pharmaceutical products. Choosing the Pharmadule way gives quick and substantial savings in valuable foreign currency.



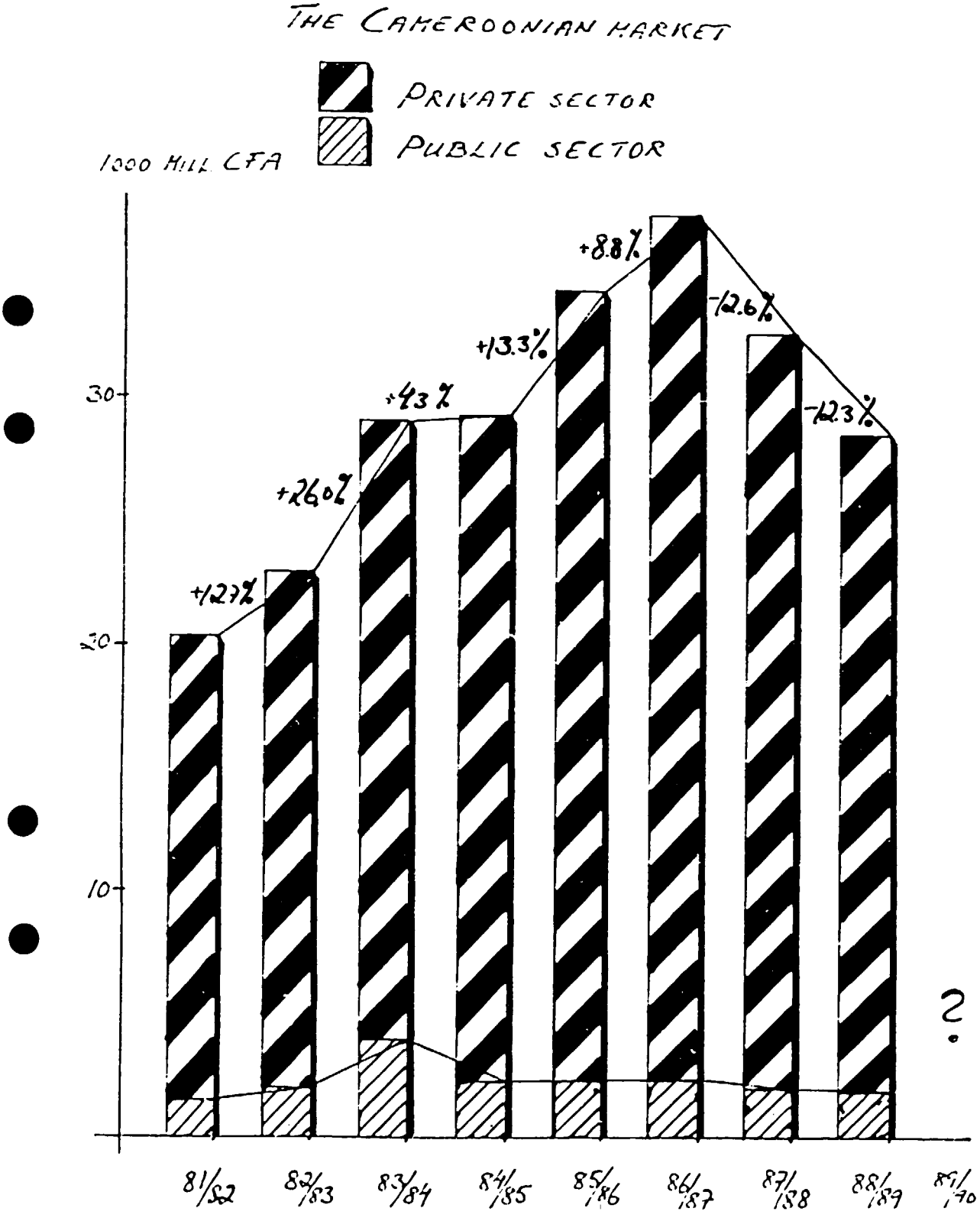
Profits from a modular Pharmadule plant always stay ahead of conventional competitors.



A bar chart clearly visualizes the income lost each year when a project is implemented conventionally. These losses will never be regained.



Stepwise expansion in response to market demands gives superior economy in comparison with conventional techniques, where plants are over-dimensioned from the start and costly extra capacity lies dormant for the first years or may never even be utilized.


THE CAMEROONIAN MARKET
PRIVATE SECTOR
PUBLIC SECTOR
1000 MILL CFA
30
20
10
+12%
+26%
+43%
+13.3%
+8.8%
-12.6%
-12.3%
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81/82
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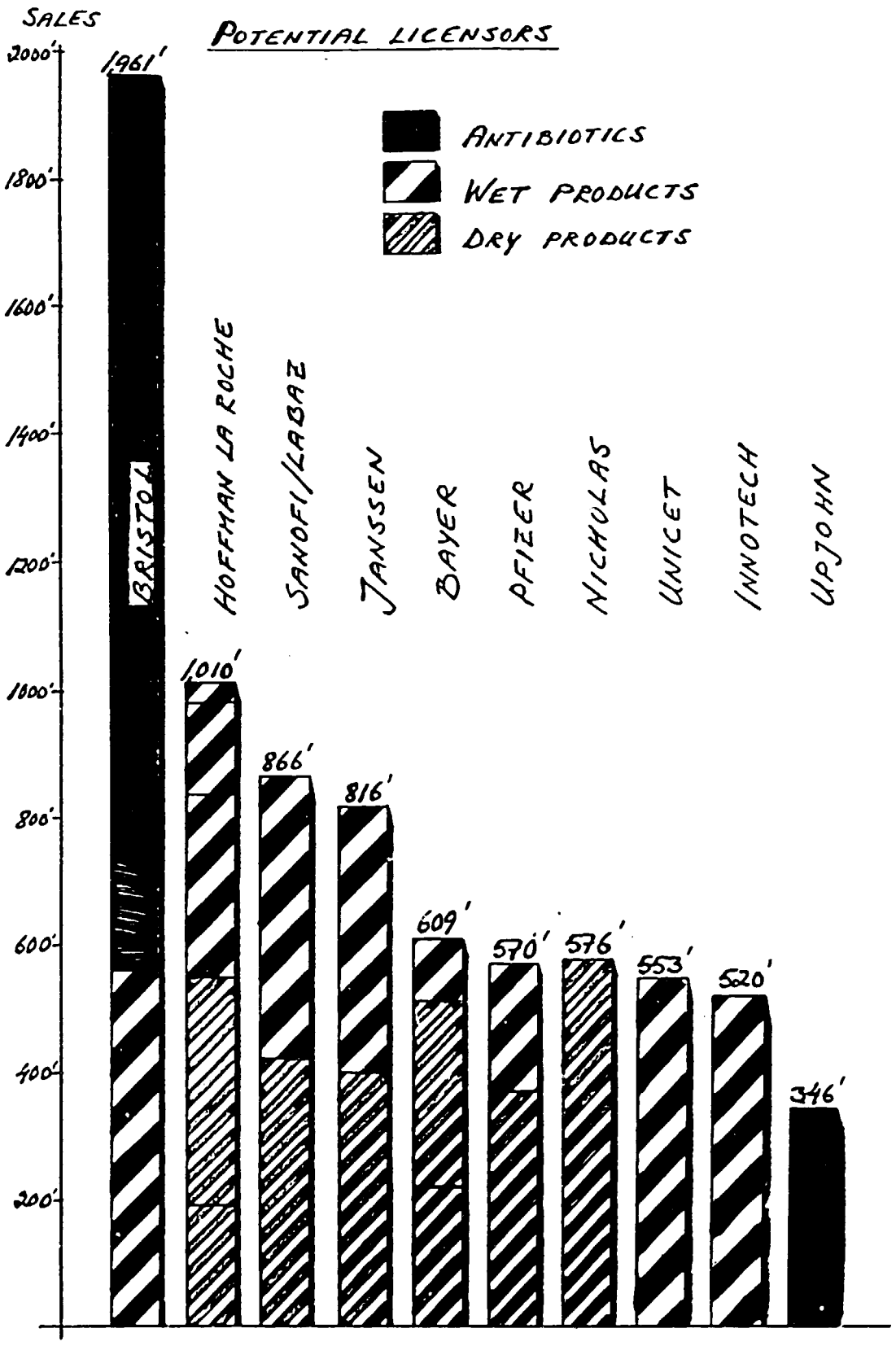
SALES
POTENTIAL LICENSORS
2000'
1800'
1600'
1400'
1200'
1000'
800'
600'
400'
200'
ANTIBIOTICS
WET PRODUCTS
DRY PRODUCTS
1961'
BRISTOL
1010'
866'
816'
609'
570'
576'
553'
520'
346'
HOFFMAN LA ROCHE
SANOFI/LABAZ
JANSSEN
BAYER
PFIZER
NICHOLAS
UNICET
INNOTECH
UPJOHN

ANNUAL SALES