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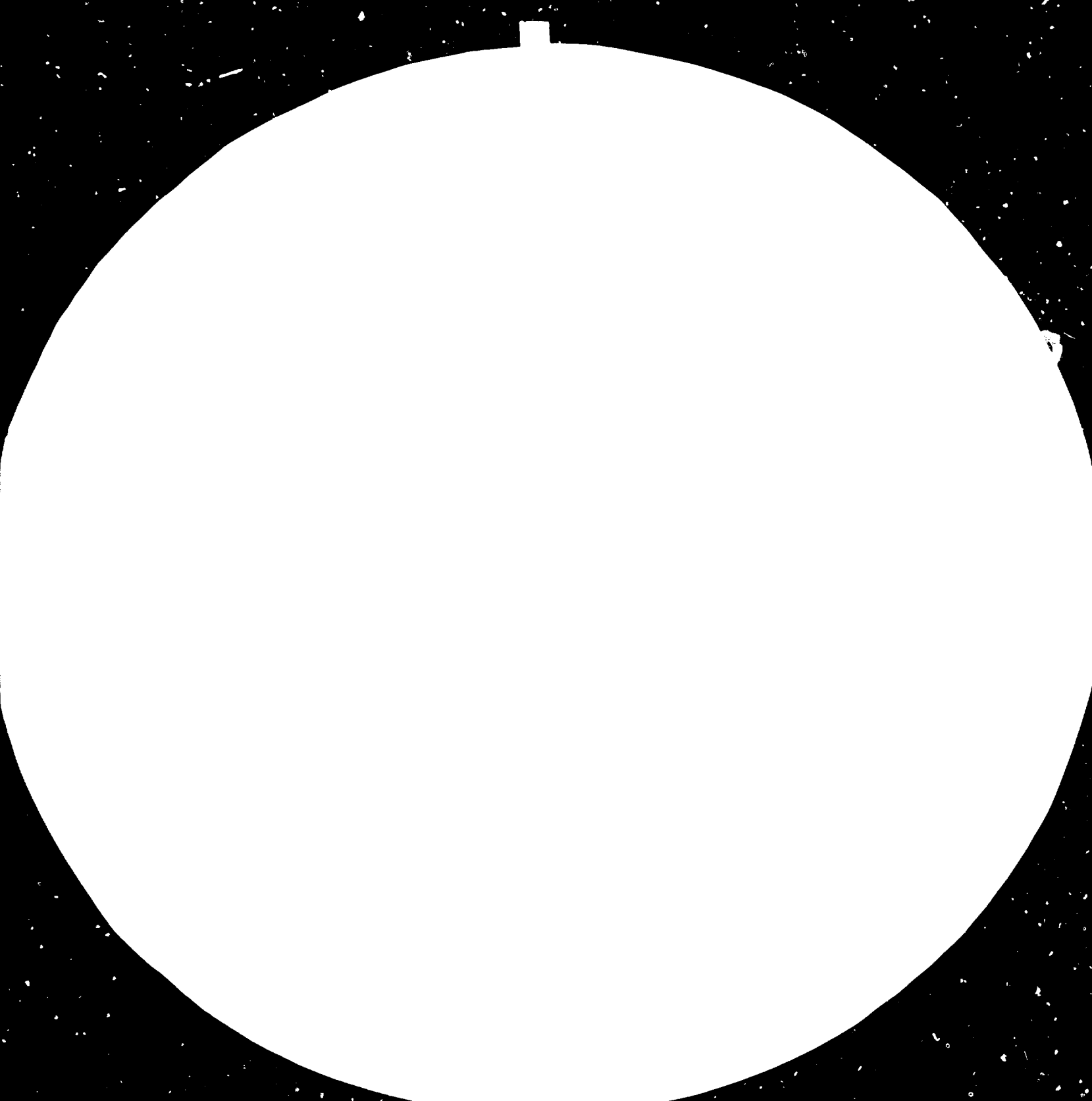

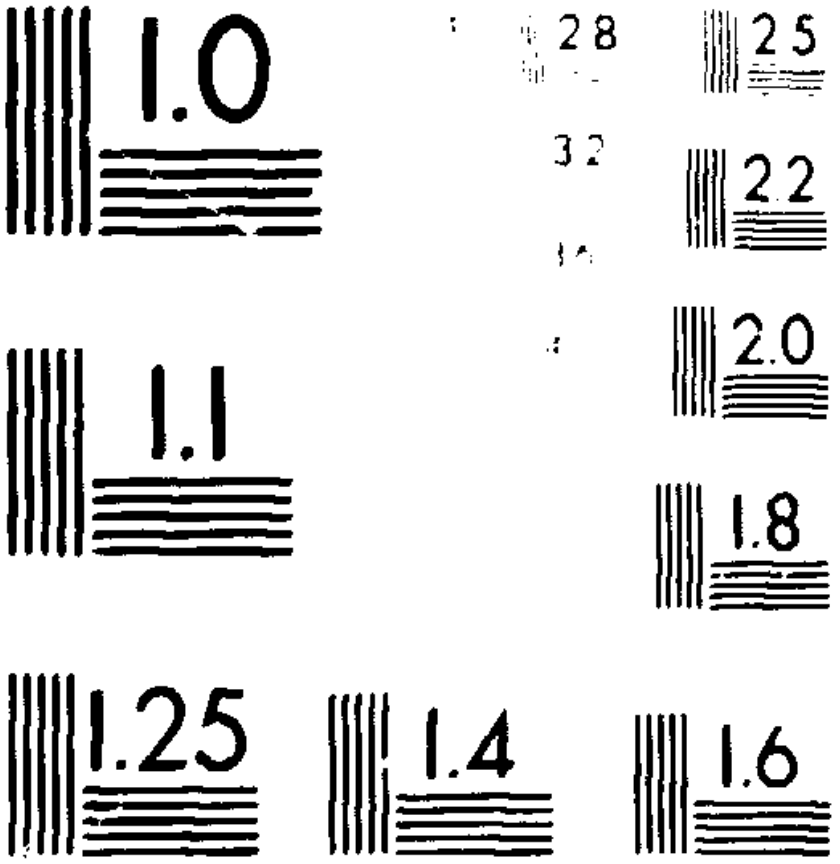

Nigeria.

# SEMINAR ON INDUSTRIAL PROJECT PREPARATION, EVALUATION, AND CONTRACTING./

13300

5th Sept - 14th Oct 1983

LAGOS, NIGERIA

Final Report

J. GLÖCKL J. [redacted]SKI M. WEBER

13300

Nigeria.

# SEMINAR ON INDUSTRIAL PROJECT PREPARATION, EVALUATION, FINANCING & CONTRACTING

From 5 th September - 14 th October, 1983

LAGOS, NIGERIA

## F I N A L  R E P O R T

RP/NIR/82/002/11-53/31.6.A

prepared by: J. GLÖCKL, UNIDO-Expert, Industrial Economist

J. KOPYTOWSKI, UNIDO-Expert, Industrial Engineer

M. WEPER, UNIDO-Expert, Financial Analyst

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# I. Final Report

## 1. OFFICIAL ARRANGEMENTS AND CONTRIBUTIONS

The SEMINAR ON INDUSTRIAL PROJECT PREPARATION, EVALUATION, FINANCING & CONTRACTING was sponsored and organized under the joint auspices of the:

- United Nations Industrial Development Organization (UNIDO)
- Federal Ministry of Industry (FMI), and
- Nigerian Industrial Development Bank (NIDB).

The UNIDO experts on mission to Nigeria appointed as seminar lecturers were: J. Glöckl (Austria), J. Kopytowski (Poland), and M. Weber (United States).

The Government of the Federal Republic of Nigeria nominated 28 to 30 participants to the seminar. Of this group, 22 participated in the seminar. The participants represented personnel engaged in both Federal and State administrative posts in Nigeria, including the directors, advisors, and evaluators of industrial investment projects.

In addition, the NIDB sent 2 of their staff to this seminar. The cross-section of participants as concerned their education and professional specification is indicated in the following table:

Number of Students:

| By Education: | | By Profession: | |
|---|---|---|---|
| University: | 13 | Economist: | 1 |
| Technical Schooling: (Chem. Engineers) | 2 | Banking: | 3 |
| | | Administration: | 7 |
| Master's: | 6 | Finance: | 1 |
| Doctorate: | 1 | Industr. Promotion: | 10 |

Before the course commenced, the instructors held coordination meetings with:

- The FMI - Department Director G. Amusa-Eke (AD-P&P)
- The UNDP - Resident Representative A. R. Roejkjaer and JPO Ove Bjerregaard
- The NIDB - Controller Assistant - O. Famuyiwa.

The meetings discussed the timing, methodology and requirements of the co-sponsers of the Course. The facilities at the NIDB were explained, and Messrs: Wale Johnson for the FMI, and O. Famuyiwa for the NIDB were appointed 'course monitors and coordinators' respectively, reporting to their sponsoring institutions.

## 2. OBJECTIVES OF THE MISSION

The objective of this mission was to contribute to the first UNIDO/FEDERAL REPUBLIC OF NIGERIA national Training Course in Industrial Project Preparation, Evaluation and Financing as lecturers, discussion monitors, and test administors. The Basic Aims of the course were to:

- teach the proven methodology developed in the UNIDO MANUAL FOR THE PREPARATION OF INDUSTRIAL FEASIBILITY STUDIES to the participants;

- teach the UNIDO/IDCAS methodology for Project Evaluation as expounded in the MANUAL FOR EVALUATION OF INDUSTRIAL PROJECTS;

- teach the methodology for Social Cost Benefit Analysis as exposed in the UNIDO GUIDELINES FOR PROJECT EVALUATION and the PRACTICAL APPRAISAL OF INDUSTRIAL PROJECTS;

- teach the concepts on contract administration expostulated in the UNIDO GUIDELINES FOR CONTRACTING FOR INDUSTRIAL PROJECTS IN DEVELOPING COUNTRIES;

- train in the practical application of these methodologies and the use of the appropriate tables and schedules in the Manuals through a Nigerian Case Study.

The task of the workshop was to cover the following main subjects:

- market analysis and forecasting techniques

- investment cost, production cost, financing plan, basic accounting concepts, and the preparation of financial statements

- investment profitability analysis and financial project appraisal

- evaluation methods such as uncertainty, sensitivity and risk analysis for ranking industrial project choices

- presentation of the basic principles of cost-benefit-analysis on the macro-economic level based on UNIDO's methods and incorporating Nigeria's national objectives.

The goal of the mission was to train a corps of officials from the Federal Ministry of Industry and the Nigerian Development Bank in the techniques of project preparation, evaluation and financing to achieve self-sufficiency to adequatly prepare and assess the feasibility of proposed industrial development projects.

This goal is part of the general goals and objectives of the UNDP SECOND COUNTRY PROGRAMME FOR NIGERIA for the period 1983-1986 (UNDP - DC/CP/NIR/2 and NOTE/2 - November 1982).

This seminar is expected to strengthen the Nigerian government's national planning machinery, mainly at the state (and Ministry) levels, including economic planning towards diversification of the national economy and balanced development of all the sectors and geographical areas of the country. The ultimate objective is to emphasize annual plan preparation and implementation for national and state governments.

## 3. ORGANIZATION OF THE COURSE

The course was organized along the lines of the UNIDO Feasibility Studies Section's Seminar Modules on Project Development. The 'core' modules of the course and the relative time in terms of percentage allocated to each were:

| | | |
|---|---|---|
| Module | 1. Outline of the Project Development Cycle | 10 % |
| | 2. Market Analysis | 15 % |
| | 3. Plant Capacity and Technical Analysis | 25 % |
| | 4. Financial Analysis | 25 % |
| | 5. Social Cost Benefit Analysis | 15 % |
| | 6. Nigerian Feasibility Study Case | 10 % |

Each class day was divided into three 1 1/2 hour lecture/discussion periods, with a coffee break between the two morning sessions, and 1 1/2 hour lunch break before the afternoon session. Time at the conclusion of each session, up to 1/2 hour, was allocated by the instructors to answering individual questions, not appropriate to the consideration of the entire class group.

The course was held in the Conference Room of the Nigerian Industrial Development Bank, 63/71 Broad Street, Lagos, First Floor. The course was inaugurated on Monday the 5th of September and continued through Friday, the 14th of October. National Holidays were declared on September 19th and 20th and October 4th.

The course was inaugurated by the Chairman of the Session, the Managing Director of the NIDB, and the Federal Minister of Industries, at an opening session. This session was televised and otherwise reported for the local press in Nigeria.

At this ceremony, the Federal Minister of Industries gave the opening lecture. In this exposé, he outlined the government policies and strategies of development for Nigeria. He also outlined the general results he expected from the seminar. At the response, given by one of the UNIDO lecturers, M. Weber, this speech was proclaimed the first lecture, and officially attached to the course teaching material.

At the opening ceremony, numerous other high officials of the Federal Nigerian Government were in attendance. The UNDP was represented by Mr. A. R. Roejkjaer, the Resident Representative in Nigeria. Mr. Ove Bjerregaard, JPO, represented UNIDO as acting SIDFA.

## 4. METHODOLOGY OF THE COURSE

In accordance with the methodological guidelines of the workshop, the material was divided into five modules or groupes plus the case study. The Outline of the Project Development Cycle, the introductory section of the course, was jointly taught by Mr. Weber and Mr. Kopytowski.

The Technical Analysis for Project Preparation was taught by Mr. Kopytowski. The Marketing section, including Demand Analysis and Forecasting Methods and the Financial Analysis section, including Accounting Principles, Ratio Analysis and the Financing of Development Projects was taught by Mr. Weber. The Social Cost Benefit Analysis Section and the Nigerian Case Study were taught by Mr. Glöckl.

In addition, three guest lecturers were invited from the Nigerian Investment community - including the Chief Economist at the NIDB; the Director (ag) National Office of Industrial Property, Federal Ministry of Science and Technology; and the Deputy Secretary, Federal Ministry of Industries - Investment Center.

Their subjects were the Problems of Obtaining Accurate Data for Marketing Analysis in Nigeria; the Evaluation of Technology Transfer Agreements; and Special Problems of Investment in Infrastructure.

Additional two lectures by Mr. Weber introduced the participants to the approximately 50 UNIDO and UNDP publications that were presented by the course lecturers. A complete listing is found in paragraph VII.

Mr. Glöckl's additional lecture on UNIDO's COMPUTER MODEL for FEASIBILITY ANALYSIS and REPORTING (COMFAR) was met with great interest, since this program also could ease the necessary calculation-work for the numerous feasibility studies to be completed in Nigeria.

The course material was covered by the lecture, class discussion, exercise and case methods. Lecturers were interrupted by questions from the students regarding relevance of the course material to the Nigerian situation, so continual adaptation was necessary.

Where possible, the lecturers introduced economic and market data from Nigeria to prove the relevance of their methods.

During the sessions the participants were requested to calculate and evaluate data supplied from real case studies and insert the results in the appropriate Tables and Schedules of the UNIDO Feasibility Manual. Considerable support in this regard was leant by the UNIDO supply of pocket calculators and Discount Tables to all participants. In addition to standard UNIDO developed course material, the lecturers prepared and developed the following collateral material:

- Economic Indicators of Nigeria (GNP, Production etc)

- Comparisons of Nigeria with other neighboring Countries in Black Africa

- Comparisons of Nigeria's Oil Production with other non-OPEC Producers in terms of development indicators

- Case data from a current marketing study on the Nigerian Cement Industry (courtesy of ECA)

- A basic bibliography for Data Sources in the field of International Trade and Economics (ITC)

- The Nigerian SUNTI SUGAR Project reworked from a consultant's study into the UNIDO Feasibility format according to the Manual

Each participant was given the following UNIDO manuals and guidelines:

- MANUAL for the PREPARATION of INDUSTRIAL FEASIBILITY STUDIES

- MANUAL for EVALUATION of INDUSTRIAL PROJECTS

- Guidelines for Project Evaluation

- Guide to Practical Project Appraisal

- Guidelines for Contracting for Industrial Projects in Developing Countries

- Compounding and Discounting Tables (World Bank)

- Guide for Preparing Industrial Project Profiles

- List of Selected UNIDO Documents and the UNIDO Mailing List Questionnaire (Document Ordering)

- Tables from UNIDO's INPUT-OUTPUT DATA BANK for Nigeria

- A short list of SITC codes

## 5. COMMENTARY

The cooperation and facilities of NIDB were overall excellent. In the first instance, the conference room facility was modern and included working blackboards and an overhead projector. The students were seated in comfortable chairs arranged behind long conference table-type desks in amphi-theatre style.

Although the reproduction facilities for handouts and slides at the NIDB were necessarily shared with all the other requirements of day-to-day development banking, there was only minimal delay or rescheduling required of course modules/lectures. In addition, the reproduction and secretarial facilities of the UNDP were utilized where necessary for backup and holiday work.

In general, daily attendance and attentiveness at the working and class sessions was very good. The average presence at all sessions was approximately 90 %. Only the days immediately preceeding or following Official Holidays evidenced a marked decline in attendance, and the material presented at these sessions was re-elaborated in abbreviated form at subsequent lectures/discussions etc. Therefore, it could be fairly stated that each and every participant has thus far been exposed to all the required course material.

However, assignments of exercises to be completed outside of the classroom was only minimally completed by a few participants. It was therefore decided that 'homework' assignments would be dropped in favor of classroom exercises.

Unfortunately, this also extended to the considerable amount of reading material, including Manuals, Guides, Guidelines, etc, that were given to each participant. It is hoped that the possession of these materials will permit each participant to read or re-read the material when either time or necessity permits or requires.

## 6. ACKNOWLEDGEMENT

The UNIDO team is grateful to the Federal Ministry of Industries of the Federal Republic of Nigeria and the Nigerian Industrial Development Bank for the arrangements and sponsorship of this course.

Special thanks are due to Mr. T.O. Johnson of the Federal Ministry and Mr. O. Famuyi, Deputy Controller of NIDB for their particular assistance which contributed greatly to the success of this mission to date.

The team is also grateful to Mr. Ove Bjerregaard, JPO and Acting SIDFA for UNIDO in Nigeria, who contributed his efforts to make the Course and the consultants stay in Nigeria a rewarding experience.

No acknowledgement would be complete without the teams gratitude being expressed to Mr. W. Behrens, Head of UNIDO's Feasibility Studies Section, as well as Mr. M. Kulczycki, and Mr. D. Rosati of the Feasibility Studies Section at UNIDO Headquarters in Vienna who programmed this seminar and assured the availability of necessary aids and Manuals. The special contribution of Mrs. Obi, Course Secretary must also be duly noted.

Messrs: J. Glöckl
J. Kopytowski
M. Weber

## II. Seminar Program

Week 1

| Time | Monday 5.9.1983 | Tuesday 6.9. | Wednesday 7.9. | Thursday 8.9. | Friday 9.9. |
|---|---|---|---|---|---|
| 8:00 - 9.30 | | Financial Analyst<br>- objectives of development (M:I, s. 2+3)<br>L | Financial Analyst<br>- Introduction to an Industrial Developm. Project (go through a summarized Feas.Study) (M:I, s.9)<br>L + D | Fin. Anal.<br>- principles of time preference<br>- compounding and discounting<br>(M:I, s.10,a,b)<br>L + E | Fin. Anal.<br>- DCF, NPV, IRR<br>- Alternative methods of appraisal<br>(M:I, s.10,d, +11)<br>L |
| 10:00 - 11:30 | Opening Ceremony | Industrial Engineer<br>- role of industrialization, industrial policies and strategies<br>- project planning (M:I, s.5+6)<br>L | Ind. Eng.<br>- Overview of the Technical Analysis<br>- Technical Analysis Procedure<br>L | Ind. Eng.<br>- developing the Production Schedule (M:III, s.3)<br>L | Ind. Eng.<br>- Choice of Technology<br>- Technology and engineering des<br>- Cost estimates (M:III, s.4)<br>L + E |
| 15:00 - 16:30 | Fin. Anal.<br>- presentation of the participants and the lecturers<br>- course outline: the project cycle (M:I, s.1)<br>D + L | Fin. Anal.<br>- Project Identification, opportunity studies (outline the manual) (M:I, s.7+8)<br>L | Fin. Anal.<br>- Introduction to an Industrial Development project.-ctd. (Focus of the building-up of a cash-flow and its analysis)<br>L + D | Fin. Anal.<br>- compounding and discounting Exercises (M:I, s.10,c)<br>E | Fin. Anal.<br>- DCF - Exercises (M:I, s.10,e)<br>E |

Week 2

| Time | Monday 12.9. | Tuesday 13.9. | Wednesday 14.9. | Thursday 15.9. | Friday 16.9 |
|---|---|---|---|---|---|
| 8:00 - 9.30 | Ind. Eng.<br>- Production Programme and Capacity Requirements (M:II, s.15)<br>L + E | Fin. Anal.<br>- Market Research (M:II, s.3)<br>L | Ind. Eng.<br>- Space Requirements<br>- Constructing a Preliminary Facilities Layout<br>- Civil works and their cost (M:III, s.14)<br>L | Fin. Anal.<br>- Data Requirements case (2)<br>E | Fin. Anal.<br>- Time Series Exerc. (M:II, s.9)<br>E |
| 10:00 - 11:30 | Fin. Anal.<br>- Basic Market Elements<br>- Demand, Supply, Price<br>- Price and Income Elasticities (M:II, s.1+2)<br>L | Ind. Eng.<br>- Production Equipm. Requirements<br>- Alternative Prod. Equipment (M:III, s.9+10)<br>L + D + E | Fin. Anal.<br>- Data Requirements case (1) (M:II, s.5)<br>E | Ind. Eng.<br>- Materials and Inputs (M:III, s.6)<br>E | Ind. Eng.<br>- Labour Requiremen (M:III, s.12+13)<br>E |
| 15:00 - 16:30 | Ind. Eng.<br>- Planning the Prod. Process (M:III, s.7+8)<br>L + E | Fin. Anal.<br>- Data Requirements and Collection (M:II, s.4)<br>L + (D) | Ind. Eng.<br>- Materials and other Inputs (M:III, s.5)<br>L | Fin. Anal.<br>- Introduction to Forecasting Methods<br>- Time Series Projections (M:II, s.7+8)<br>L | Fin. Anal.<br>- Regression Analys (theory)<br>- Regression Anal. (Exercise) (M:II, s.10+11)<br>L + E |

| Time | Monday 19.9. | Tuesday 20.9. | Wednesday 21.9. | Thursday 22.9. | Friday 23.9. |
|---|---|---|---|---|---|
| 8:00 - 9.30 | Fin. Anal.<br>- Marketing and Distribution Arrangements (M:II, s.12)<br>L | Fin. Anal.<br>Econ. Anal.<br>- Demand Forecasting, Sales, Pricing, Marketing and Production Estimates (case) (M:II, s.16)<br>E | Fin. Anal.<br>- Project Accounting Procedures (1) (M:IV, s.1)<br>L | Fin. Anal.<br>- Investment Appraisal Methods (M:IV, s.3)<br>L | Fin. Anal.<br>- Dept Repayment Schedules<br>- Dept Repayment Schedules, Exerc M:IV, s.4+5)<br>L + E |
| 10:00 - 11:30 | Ind. Eng.<br>- Location and Site Analysis (theory) (M:IV, s.16)<br>L | Fin. Anal.<br>Econ. Anal.<br>---"---<br>(M:II, s.16)<br>E | Ind. Eng.<br>- Location and Site Analysis (case) (M:III, s.17)<br>E | Ind. Eng.<br>- Technology transfer<br>L | Ind. Eng.<br>- Implementation Schedule (M:III, s.15?)<br>L + E |
| 15:00 - 16:30 | Fin. Anal.<br>- Pricing Policy (M:II, s.13+14)<br>L + E | Fin. Anal.<br>Econ. Anal.<br>---"---<br>(M:II, s.16)<br>E | Fin. Anal.<br>- Project Accounting Procedures (2)<br>- Total Cost Schedules (M:IV, s.1+2)<br>L | Econ. Anal.<br>- Introduction into the national case study (I)<br>E | Econ. Anal.<br>- Carrying on national case study (II)<br>E |

| Time | Monday 26.9. | Tuesday 27.9. | Wednesday 28.9. | Thursday 29.9. | Friday 30.9. |
|---|---|---|---|---|---|
| 8:00 - 9.30 | Fin. Anal.<br>- Cost of Capital to the firm (M:IV, s.6)<br>L | Fin. Anal.<br>- Ratio Analysis (M:IV, s.8)<br>L + E | Fin. Anal.<br>- Source of Finance<br>- Impact of Inflation (M:IV, s.9+10)<br>L + D | Fin. Anal.<br>- Risk, Break Even and Sensitivity Analysis (M:IV, s.11)<br>L | Fin. Anal.<br>- Sensitivity Analysis ctd. and Exercise (M:IV, s.11+12)<br>L + E |
| 10:00 - 11:30 | Fin. Anal.<br>Econ. Anal.<br>- Project Accounting Exercises (1) (working capital estimates, cash flows) (M:IV, s.7)<br>E | Fin. Anal.<br>- Ratio Analysis (M:IV, s.8)<br>E | Econ. Anal.<br>- Introduction to SCBA<br>- Interdependence between Prices and National Economic Policy) (M:V, s.1+2)<br>L | Econ. Anal.<br>- Introduction to Shadow Prices (M:V, s.4)<br>L | Econ. Anal.<br>-Procedures for Shadow Price Determination<br>- Shadow Exchange R. Calculations (M:V, s.7+8)<br>L + E |
| 15:00 - 16:30 | Fin. Anal.<br>Econ. Anal.<br>- Project Accounting Exercises (2) (balance sheets, rates of return) (M:IV, s.7)<br>E | Econ. Anal.<br>- Carrying on national case study (III)<br>E | Econ. Anal.<br>- carrying on national case study (IV)<br>E | Econ. Anal.<br>- Calculation of Shadow Prices (linear programme) (M:V, s.5)<br>E | Econ. Anal.<br>- Shadow Exchange Rate Calculation ctd.<br>- Shadow Wage Rate Calculations (M:V, s.8+9)<br>L + E |

| Time | Monday 3.10. | Tuesday 4.10. | Wednesday 5.10. | Thursday 6.10. | Friday 7.10 |
|---|---|---|---|---|---|
| 8:00 - 9.30 | Fin. Anal.<br>- Project Financial Plan (M:IV, s.13)<br>L + E | Fin. Anal.<br>- Review of Financial Analysis (M:IV, s.14)<br>L | Econ. Anal.<br>- Value Added Method (Effects-Method) (M:V, s.15)<br>L | Econ. Anal.<br>- UNIDO + IDCAS Method (V)<br>L | Econ. Anal.<br>- Comprehensive Method of Project Evaluation (M:V, s.14)<br>L |
| 10:00 - 11:30 | Econ. Anal.<br>- National Objectives and Project Evaluat.<br>- Regional Development Objectives (M:V, s.10+11)<br>L + E | Econ. Anal.<br>- OECD - Method, Little-Mirrlees<br>- SCBA, Squire Van der Tak (V)<br>L | Econ. Anal.<br>- Value Added Method Exercise (V)<br>E | Econ. Anal.<br>- UNIDO - IDCAS Method (case) (V)<br>E | Fin. Anal.<br>- written quiz on project evaluation |
| 15:00 - 16:30 | Econ. Anal.<br>- Income Distribution Objective (M:V, s.12)<br>L + E | Fin. Anal.<br>- Application of Risk and Sensitivity Analysis to the national case study (to be prepared by Fin.An.) (IV)<br>E | Fin. Anal.<br>- Application of Risk and Sensitivity Analysis to the national case study, ctd. (IV)<br>E | Econ. Anal.<br>- Economic Analysis of the national case study (V)<br>E | Econ. Anal.<br>- Economic Analysis of the national case study (V)<br>E |

Week 6

| Time | Monday 10.10. | Tuesday 11.10. | Wednesday 12.10. | Thursday 13.10. | Friday 14.10. |
|---|---|---|---|---|---|
| 8:00 - 9.30 | Guest<br>- Investment in infrastructure (special problems, financing, costs and benefits) (VI)<br>L | Study Visit to Nigerian Distilleries Ltd.<br>and<br>Central Packages of (Nig.)Ltd. | Econ. Anal.<br>(II)<br>Magera Fruit Processing Project<br>E | Econ. Anal.<br>(IV)<br>E | Mr.M. Kulczycki<br>UNIDO and its work for development importance of the Feasibility Studies Section (VI)<br>L |
| 10:00 - 11:30 | Guest<br>- Project Promotion<br>L | | Econ. Anal.<br>(II)<br>E | Econ. Anal.<br>(V)<br>E | Mr.M. Kulczycki<br>Evaluation of the seminar by the participants |
| 15:00 - 16:30 | Guest<br>- Tendering Procedures<br>- Management and Marketing Arrangements<br>(VI)<br>L | | Econ. Anal.<br>(III)<br>E | Econ. Anal.<br>(V)<br>E | Closing<br>Ceremony |

## III. List of Participants

## LIST of PARTICIPANTS

| | |
|---|---|
| Adeshina Ola ADIGUN | NIDB |
| David Chukwuemeka OKOYE | Min. Indust. - IMO |
| Jeff Tihi YAJI | Min. Indust. - BENUE |
| James Adeniran OLAWUNI | Min. Indust. - OYO |
| Wesley O. AIYEGBOKA | Nat. Bank Comm. & Ind. |
| E. C. ECHOMGBE | Min. Indust. - RIVERS |
| L. A. JUNAID | NIDB |
| B. J. DAWA | Exec. Off. President |
| Williams F. BOKASSAH | Min. Indust. - NIGER |
| Jacob Adeyanju ALEGBELEYE | Fed. Min. Indust. |
| S. C. IWUCHUKWU | Min. Indust. - BAUCHI |
| T. A. ABIJO | IDC - Benin City |
| A. ADESEYE | IDC - Oshogbo |
| G. A. AKINGBALA | Min. Indust. - OGUN |
| V. O. E. ADEOBA | Exec. Off. President |
| O. A. KAYODE | IDC - Oshogbo |
| Alexie N. NJOKU | Fed. Min. Indust. |
| M.A. NWACHUKWU | Fed. Min. Indust. |
| F. A. OGUNTOYE | Min. Plan - OGUN |
| Nwafor C. OJI | IDC - Owerri |
| L. G. SALAMI | IDC - Port Harcourt |

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IDC = Industrial Development Center

NIDB = Nigerian Industrial Development Bank

## IV. Program of Opening Ceremony

SEMINAR ON INDUSTRIAL PROJECT PREPARATION, EVALUATION, FINANCING & CONTRACTING ORGANISED UNDER THE AUSPICES OF THE FEDERAL MINISTRY OF INDUSTRIES IN COLLABORATION WITH THE NIGERIAN INDUSTRIAL DEVELOPMENT BANK AND THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION.

## Programme of Events for the Opening Ceremony

| | | |
|---|---|---|
| 1. | 9.30 a.m. | Participants get seated |
| | 9.45 a.m. | Guests get seated. |
| 3. | 10.00 - 11.30 a.m. | |
| | - | The Honourable Minister arrives, |
| | - | Introduction of the Chairman - Mr. M. A. PASHANU, AGM (MDD)-NIDB. |
| | - | The Chairmans Opening Remarks - Managing Director, NIDB. |
| | - | The Honourable Minister's Opening speech. |
| | - | UNIDO Representative's Remarks. |
| | - | Chairman's Closing Remarks. |
| | - | Vote of Thanks - MR. G. AMUSA-EKE, AD(PAP) - F.M.I. |
| | - | Coffe Break. |
| 11.30 a.m. | | The Honourable Minister departs. |

/C.N.UGO./

V: Speech delivered by the honourable Minister of Industries, ALHAJI AKANBI ONIYANGI

SPEECH DELIVERED BY THE HONOURABLE MINISTER OF INDUSTRIES, ALHAJI AKANBI ONIYANGI A[illegible]COURSE ON INDUSTRIAL PROJECT PREPARATION, EV[illegible]TION, FINANCING AND CONTRACTING HELD AT NDE, IKEJA FROM 5TH SEPTEMBER - 14TH OCTOBER, 1983

Ladies and Gentlemen,

You will permit me to start by expressing my appreciation to the Organizers of this Seminar which is considered a very important mile-stone in the efforts of United Nations Industrial Development Organization (UNIDO) to translate into reality the desire of the United Nations to contribute its quota to the manpower development programme of the Third World.

2. Hitherto, Nigeria has sent its personnel outside the country for training facilities in project preparation and evaluation. It is gratifying that, today, UNIDO is making history by bringing to our door steps the same knowledge which we scouted round the world to acquire. It is my hope that the experience gathered in the process of organizing this course will be utilized in future to enable more Nigerians gain from similar exercises conducted wholly by Nigerians.

3. Project Preparation: Nigeria has for sometime embraced the practice of project preparation, evaluation financing and contracting and I am particularly happy that this course will afford our experts the opportunity to apprise themselves of the latest techniques and practices in these fields. Project Preparation is a vital instrument in the realisation of the objectives of National Development Plans. It therefore has to be undertaken with national goals in mind. This inevitably involves consideration of national priorities according to which resources are allocated for the achievement of identified goals. The main parameters I consider very important in the allocation of national resources are the Standard of living of the populace, development of agriculture, industry, imports and exports, employment generation and provision of social services. However, our main area of attention in the course we about to begin today is the industrial sub-sector. Here, the maximum utilisation of the

locally available agricultural and mineral resources is a key factor to be considered in the process of project preparation. The feasibility of projects may also rest on the availability of market for their products, availability of raw material inputs, skill in securing the right technology, availability of manpower for project implementation, access to capital for investment and method of financing and procurement of inputs. It is therefore necessary for our planners and project managers to have adequate knowledge of these issues to ensure that the nation's resources allocated to the attainment of national goals do not go down the drain. Indeed, our experience in the early stages of the development of some of our projects has shown that even the best experts may be tempted to give wrong advice as a result of wrong assumptions totally unrelated to the Nigerian experience. The course organizers will do well to take note of this very important consideration (i.e. assumptions and local realities) in plan preparation and ensure that the Course will bear relevance to our national environment and aspiration.

4. Project Contracting: As I gathered, the objective of the Course is to assist the Government and Semi-Government Agencies concerned with industrial project planning to improve their current practices in all the subjects to be covered. The objective is laudable and commendable. However, in the pursuit of the objective, I would like the Organizers of the Course to bear in mind the best utilisation of the available national resources in terms of technology, manpower, raw materials, time and finance. Project Contracting play a very crucial role in maximising national gains in these areas particularly in the transfer of technology, manpower development, project financing, spare parts requirements, guarantee of raw materials etc. It is also a vital aspect in the process of project execution. I therefore wish that this subject be given the close attention it deserves. From the Nation's past experiences, it is imperative that our experts have to get

to grips with the rudimentaries of certain essential contract elements in order to forestall circumstances which have hitherto led to difficult experiences in the implementation of some of our industrial projects. Such contract elements include for example (a) the role of the supplier/contractor of technology, equipment etc.; (b) administrative provisions, (c) agreement on language to be used in respect of production instructions, (d) determination of the boarder between the scope of undertakings of the supplier/contractor and the duties of the employer, (e) appropriate procedures for monitoring of contract performance (f) the right to request change, (g) control over use of sub-contractors, sub-suppliers and personnel so as to enable us tap, as much as possible, available local resources (h) the right to terminate the contract if deemed necessary in the national interest, and most importantly (i) applicable law and arbitration. If not properly understood, this lastly mentioned contract element could cause hard feelings in international relations. Indeed, my Ministry already has a story to tell on this.

5. Project Financing: In the area of project financing, I believe that Government usually loses out to its technical partners, largely through ignorance or over-sight on the part of our relatively in-experienced project planners and managers who inadvertently allow components of project expenditure usually incurred by the Government at the initial stages of a project to remain unrecovered. A good example is in respect of expenditure incurred in travelling abroad to negotiate for technical partners or in arranging relevant facilities locally for project to take off. These expenditures, I believe, should be taken into consideration while discharging our financial obligations on contracts. In most cases this is not so. The present economic circumstances of the country which calls for austere measure, in all realms of our economic endeavours must be borne in mind in our approach to project financing. There should be a thorough

examination of existing practices with a view to ensuring efficient use of our meagre financial resources. Consideration is therefore to be given to various means of bringing this about. In this regard, we should endeavour to examine the use of Supplier's Credits for complete financing or as supplement to loans or grants, Compensation deals or buy-back deals, assumptions about interest rates, grace periods, amortization periods, bank charges, sources of equity and loan finance etc.

6. Project Evaluation/Appraisal:

I should let you know that in the immediate future, the policy of Government as far as project financing in the industrial sector is concerned is to concentrate the available meagre resources on consolidating what we already have in the industrial set-up rather than on new projects. Thus, more attention is to be focussed, in the short-term, on the existing industrial plants and on-going projects. In this connection, the knowledge to be gained from what you teach on Project Evaluation and Appraisal will be most valuable. I have no doubt that you will expose your experts to the latest techniques in financial and economic analysis. You should examine the various approaches to this subject and ensure that parameters relevant to our economic circumstances are taken into consideration. Most developing countries have had course to disagree with some aspects of the World Bank approach but whatever approach is considered best in the interest of our national economy should be our concern. The maximization of LOCAL VALUE-ADDED by our industrial projects should be given the attention it deserves. How this could be achieved in the existing and on-going projects should be looked into and the criteria for its achievement in any project examined. Such criteria may include the use of local natural resources in our commercial products, development f

commercial and technological know-how, minimisation of imported inputs, export promotion drives etc. All these touch on the important issue of local resource utilization that should receive adequate attention in our approach to Project Evaluation and Appraisal.

7. The present Administration, as you are well aware, has among its top priority areas, iron and steel, agro-based industries, petro-chemical, pharmaceutical and engineering industries. The course organizers should therefore endeavour to see how the course can address itself to our problems in these and other industrial areas. A major concern to the entire Nation is the existence of several Public Sector Industries that have proved unviable despite promising Evaluation Reports prepared by experts on the viability of the projects before they were embarked upon. One is tempted to feel that either wrong assumptions must have been made in the examination of the projects or that things went wrong at the implementation or execution stage. I sincerely hope that this course will take account of the Nigerian experience so that the country can be properly guided in its future industrial investments.

8. I would like to congratulate the various participants for their nomination for this course. I am particularly happy that my Ministry brought in State Government officials to benefit from the course. I have no doubt that their exposure will be beneficial to the industrial sector of the National Economy.

9. Lastly, let me express my appreciation to the Managing Director of the Nigerian Industrial Development Bank and his officials for making the Bank's facilities available for the organizers of the course. My heartfelt thanks also go to the United Nations Industrial Development Organization who have contributed immensely to the organization of the course. It is my candid hope that my Ministry and your organisations will continue to collaborate in similar and other ventures.

11. Ladies and Gentlemen, it is with great delight and pleasure that I declare the course open.

11. Thank you.

## VI. Program of Closing Ceremony

SEMINAR ON INDUSTRIAL PROJECT PREPARATION, EVALUATION, FINANCING AND CONTRACTING ORGANISED UNDER THE AUSPICES OF THE FEDERAL MINISTRY OF INDUSTRIES IN COLLABORATION WITH THE NIGERIAN INDUSTRIAL DEVELOPMENT BANK AND THE UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

## Programme for the Closing Ceremony

1.30 p.m. Participants get seated.

1.45 p.m. Guests Arrive.

1.50 p.m. The Permanent Secretary, Federal Ministry of Industries; The Chairman of the occassion and the Managing Director - NIDB arrive.

2 - 3,30 p.m.

- Introduction of the Chairman - MR. FASHANU, AGM(MDD) NIDB.
- The Chairman's Opening Remarks
- UNIDO Representative's Remarks
- Remarks by a Representative of Course-Participants.
- Presentation of Certificates to Course - participants - The Permanent Secretary Federal Ministry of Industries.
- Refreshments.
- Chairman's Closing Remarks
- Vote of Thanks - Mr. G. AMUSA-EKE (AD(P&P) F.M.I.

3.30 p.m. The Permanent Secretary F.M.I, the Chairman, the Managing Director - NIDB and the Guests depart.

## VII. List of Documents Previewed Daily by Seminar Participants

LISTING of DOCUMENTS PREVIEWED
DAILY BY SEMINAR PARTICIPANTS

| | |
|---|---|
| WORLD INDUSTRY IN 1980 | ID/269 |
| WORLD INDUSTRY SINCE 1960 | ID/Conf.4/2 |
| INDUSTRY 2000 - NEW PERSPECTIVES | ID/237 |
| A PROGRAM FOR THE INDUSTRIAL DEVELOPMENT DECADE FOR AFRICA | ID/287 |
| FINANCIAL RESOURCES FOR INDUSTRIAL PROJECTS IN DEVELOPING COUNTRIES | P1/61/Rev.2 Vols 1 & 3 |
| LIMA DECLARATION AND PLAN OF ACTION ON INDUSTRIAL DEVELOPMENT & COOPERATION | P1/38 |
| IMPLEMENTATION OF LIMA DECLARATION AND PLAN | ID/238 |
| NEW DELHI DECLARATION AND PLAN OF ACTION | P1/72 |
| THE INITIATION AND IMPLEMENTATION OF INDUST- | ID/146 |
| RIAL PROJECTS IN DEVELOPING COUNTRIES | |
| GUIDELINES FOR THE ACQUISITION OF FOREIGN TECHNOLOGY IN DEVELOPING COUNTRIES | ID/98 |
| GUIDELINES FOR THE ESTABLISHMENT OF INDUST-RIAL ESTATES IN DEVELOPING COUNTRIES | ID/220 |
| THE EFFECTIVENESS OF INDUSTRIAL ESTATES IN DEVELOPING COUNTRIES | ID/216 |
| INDUSTRIAL AND TECHNOLOGICAL INFORMATION BANK | P1/68 |
| MARKETING MANAGEMENT AND STRATEGY FOR THE DEVELOPING WORLD | ID/153 |
| INDUSTRIAL TECHNOLOGY IN AFRICA | IS/222 |
| UNIDO INPUT-OUTPUT DATABANK | IS/238 |
| AN INVENTORY OF INDUSTRIAL STATISTICS IN THE UNIDO DATA BANK | IS 385 |
| OPPORTUNITIES FOR COOPERATION AMONG THE DEVELOPING COUNTRIES FOR THE ESTAB-LISHMENT OF THE PETROCHEMICAL INDUSTRY | IS/376 |
| PETROCHEMICAL INDUSTRIES IN DEVELOPING COUNTR. | ID/46 |
| HANDBOOK ON INDUSTRIAL STATISTICS | ID/284 |
| AGRICULTURAL MACHINERY AND RURAL EQUIPMENT IN AFRICA | IS/377 |
| TECHNICAL CRITERIA FOR THE SELECTION OF WOOD-WORKING MACHINERY | ID/247 |
| UNIDO MODEL FORM OF TURNKEY LUMP SUM CONTRACT FOR THE CONSTRUCTION OF A FERTILIZER PLANT INCLUDING GUIDLINES | PC.25 |
| INDUSTRIAL DEVELOPMENT STRATEGIES AND POLICIES AND SOCIO-ECONOMIC DEVELOPMENT IN THE DEVELOPING COUNTRIES | IS/380 |

| | |
|---|---|
| CONCEPTUAL AND POLICY FRAMEWORK FOR APPROPRIATE INDUSTRIAL TECHNOLOGY | ID/232 vol.1 |
| APPROPRIATE INDUSTRIAL TECHNOLOGY FOR LOW COST TRANSPORT IN RURAL AREAS | " vol.2 |
| APPROPRIATE INDUSTRIAL TECHNOLOGY FOR PAPER PRODUCTS AND SMALL PULP MILLS | " vol.3 |
| APPROPRIATE INDUSTRIAL TECHNOLOGY FOR TEXTILES | " vol.6 |
| APPROPRIATE INDUSTRIAL TECHNOLOGY FOR SUGAR | " vol.8 |
| APPROPRIATE INDUSTRIAL TECHNOLOGY FOR DRUGS AND PHARMACEUTICALS | " vol.10 |
| INDUSTRIALIZATION OF DEVELOPING COUNTRIES-- PROBLEMS AND PROSPECTS : | ID/40 series |
| IRON AND STEEL INDUSTRY | " vol.5 |
| CHEMICAL INDUSTRY | " vol.8 |
| MANUAL FOR PLANNING THE DEVELOPMENT OF CAPITAL GOODS INDUSTRIES | IO/548 |
| INDUSTRIAL PRODUCTION OF COCONUT CREAM | IO/528 |
| CHANGING PATTERNS OF TRADE IN WORLD INDUSTRY : AN EMPIRICAL STUDY ON REVEALED COMPARATIVE (ECONOMIC) ADVANTAGE | ID/281 |
| SOCIAL ASPECTS OF INDUSTRIALIZATION | IS/356 |
| POTENTIAL FOR THE DEVELOPMENT OF A PROTEIN SWEETNER INDUSTRU IN AFRICA | IS/397 |
| UNIDO'S CONTRIBUTION TO THE INTERAGENCY STUDY ON INTERRELATIONSHIP BETWEEN POPULATION, RESOURCES, ENVIRONMENT AND DEVELOPMENT | IS/374 |
| PATTERNS AND PROSPECTS FOR EAST-SOUTH TRADE IN THE 1980'S | IS/335 |
| ITC CORE LIST - BASIC DOCUMENTATION FOR TRADE INFORMATION SERVICES | 1982 ed. |
| DEVINDEX AFRICA - UN ECONOMIC COMMISSION FOR AFRICA -1980 ed. | vol. 1 & 2 |
| NIGERIAN INDUSTRIAL POLICY AND STRATEGY - GUIDELINES FOR INVESTORS | Min. Plan Nigeria |
| DEVELOPMENT OF INDUSTRIAL EXPORTS | ID/17 |
| INDUSTRY AND DEVELOPMENT ISSUES 5, 6 and 7 | ID/SER/M |
| FINANCE AND DE VELOPMENT QUARTERLY Sept. 1983 Issue | IMF/WORLD BANK |
| UNIDO NEWSLETTERS | |
| UNDP ASSISTANCE REQUESTED BY THE GOVERNMENT OF NIGERIA 1983-1986 | UNDP/CP/NIR/2 |
| FOREIGN ECONOMIC TRENDS FOR NIGERIA - JULY 1983 | U.S.EMBASSY ECONOMIC DEPT. |
| MARKETING IN NIGERIA - U.S. DEPT. of COMMERCE | |

| | |
|---|---|
| MINERAL PROCESSING IN DEVELOPING COUNTRIES | ID/253 |
| INDUSTRIAL PRIORITIES IN DEVELOPING COUNTRIES | ID/217 |
| INCENTIVE POLICIES FOR INDUSTRIAL DEVELOPMENT | ID/53 vol.1 |
| RECENT INDUSTRIAL DEVELOPMENT IN AFRICA | ICIS/117 |
| APPROPRIATE INDUSTRIAL TECHNOLOGY FOR: | |
| OIL AND FATS | ID/232 vol.9 |
| BASIC INDUSTRIES | " vol.13 |
| INDUSTRIALIZATION OF DEVELOPING COUNTRIES-- PROBLEMS AND PROSPECTS : | ID/40 Series |
| FOOD PROCESSING | " vol.9 |
| MANPOWER FOR INDUSTRY | " vol.14 |
| REGIONAL COOPERATION | " vol.18 |
| TECHNICAL COOPERATION | " vol.21 |

## VIII. List of Annexes

## LIST of ANNEXES:

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given by guest lecturer:
Dr. O.O. ILESANMI, Fed. Min. of Indust., Investment Information & Promotion Centre

**ANNEX 2:** Guest lecture:
"Evaluation of Technology Transfer Agreements"
given by guest lecturer:
Mr. F.J. OKONO - AG Director - National Office of Industrial Property (NOIP)

**ANNEX 3:** Guest lecture:
Case Study of Evaluation and Registration of Technology Transfer Agreements

**ANNEX 4:** Guest lecture:
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given by guest lecturer:
Mr. G. K. AJAYI, Chief Economist, Nigerian Industrial Development Bank Limited (NIDB)

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18 questions to be answered by the participants of the seminar

**ANNEX 6:** Teaching Materials and Outlines for Slides, Module I: Outline of the Project Development Cycle

**ANNEX 7:** Teaching Materials and Outlines for Slides, Module II: Market Analysis

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**ANNEX 9:** Teaching Materials and Outlines for Slides, Module IV: Financial Analysis

**ANNEX 10:** Introduction to UNIDO's Computer Model for Feasibility Analysis and Reporting (COMFAR)

**ANNEX 11:** National Case Study: SUNTI SUGAR PROJECT Technical Data

**ANNEX 12:** National Case Study: SUNTI SUGAR PROJECT Solution Set

**ANNEX 1:** Guest lecture:
"Investment in Infrastructure: Special Problems, Financing, Costs and Benefits"
given by guest lecturer:
Dr. O.O. ILESANMI, Fed. Min. of Indust.,
Investment Information & Promotion Centre

UNIDO SEMINAR ON INDUSTRIAL PROJECT PREPARATION EVALUATION, FINANCING AND CONTRACTING: 5TH SEPTEMBER TO 14TH OCTOBER, 1983

# SEMINAR PAPER ON "INVESTMENT IN INFRASTRUCTURE: SPECIAL PROBLEMS, FINANCING, COSTS AND BENEFITS"

BY

DR. O. O. ILESANMI
Federal Ministry of Industries,
Investment Information & Promotion Centre,
New Secretariat,
Ikoyi, Lagos

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In most African countries, especially in the period since most of them attained political independence, investments have been largely concentrated on directly productive sectors of the economy such as industry, transport, telecommunications, power, and agriculture. Most economists involved in their planning processes believe, alsmot as an article of faith, that investments in these productive sectors contribute more to the acceleration of rapid economic growth. This trend was first noticed in Nigeria with the launching by the Colonial Government of the Ten-Year Programme of Development and Social Welfare in 1946 (Government Printer, 1946). This same trend has been repeatedly articulated in the country's post-independence development programmes by successive Governments.

In a mixed developing economy like ours, one principal role of Government is the provision of infrastructural facilities for social and economic development. The efficiency and effectiveness of infrastructural facilities is not only crucial to integrated social development but also to rapid industrialisation. This is because the way these public utilities are managed not only affect the cost of industrial production and consequentky the price level of goods and services produced and consumed but also has positive or negative linkage effects on the business community and the consuming public.

Infrastructural facilities in the context of this seminar refer to essential public utilities such as electricity,

water, roads, rail, inland waterways, telephones, telecommunications and mail services whose adequacy not only enhances a country's ability to fully integrate socially and economically its rural and urban communities but also accelerates industrialisation of the country as a whole. Infrastructural development by Government has its origin in the fewness of people with sufficient capital and the required managerial capability to promote and execute such enterprises. Moreover, the need to avoid the uneconomic duplication of these services is also responsible for Government monopoly of infrastructural development. It is also significant to note that the original underpinning philosophy guiding the establishments of infrastructures is service although in the performance of such services, they are expected to be self-supporting.

The current dilemma of these service-oriented establishments is how to reconcile the demands for cheap and efficient service with financial self-sufficiency. There is, therefore, the recurring problem of striking a satisfactory balance between the demands of a public-service oriented enterprise and the monetary expectation of a commercially-oriented service. This present dilemma is apparently the root cause of the much flogged inefficiency of the country's key public utilities, which has, for sometime, generated a great deal of controversy among industrialists as well as the consuming public. The view is widely held in some quarters that the inefficiency of the key parastatals has contributed in no small measure to the inefficient use of foreign exchange earnings. It is the belief in these quarters that the inability of the Nigerian Electric Power Authority (NEPA) to guarantee continuous supply of electricity has led to the massive importation of generators for household and industrial uses. Similarly, it is also alleged that the inability of the various water corporations to guarantee continuous flow of water has resulted in "unwholesome" expenditure on sinking boreholes for households and industries. It has equally been pointed out that the

the telephone system has created a situation where private firms have had to buy and install radio contact among member firms. The apparent consensus, therefore, is that the amount of foreign exchange required on these key utilities are more often than not colossal and because they are avoidable could have been available for other essential uses (especially in this period of acute shortage of foreign exchange) to finance importation of raw materials and other essential industrial inputs.

The point must, however, be made that prior to the oil-boom of the 1970s, discrepancies between available levels of infrastructural facilities and sectoral requirements especially in the urban areas were either hardly noticeable or rarely aggressively agonising. This seemingly harmonious state of affairs began to disintegrate when the gap between investments in manufacturing and allied economic activities, building and construction and infrastructural facilities like electricity, water and telecommunications began to widen. The present inadequancies of these infrastructural facilities which are now constituting enormous constraints on further industrial and business expansion are products of past discrepancies in resource allocations and resource mix by both the private and public sectors of the economy. It is significant to observe in this connection that whilst public sector resources allocation to infrastructural development from the 1960s has been increasing steadily, private sector investment in industrial construction and business expansion has been increasing rather more rapidly.

From available records, the public-sector capital investment allocation for infrastructural development from the 1970-74 to the 1981-85 Plan Periods is as follows:-

| Plan Period | Plan Size ₦ million | Power ₦ million | Transport ₦ million | Water ₦ million | Communi-cations ₦ million |
|---|---|---|---|---|---|
| 1970 - 74 | 2,050.738 | 90.650 | 472.398 | 3.646 | 83.282 |
| 1975 - 80 | 43,314.009 | 1,075.238 | 3,677.541 | 1,358.553 | 1,338.944 |
| 1981 - 85 | 70,276.225 | 3,106.259 | 10,706.616 | 3,746.109 | 2,000.000 |

It will be observed from the table at page 3 that a considerable chunk of the total capital investment allocations during the three plan periods have been allocated to the four sub-sectors constituting the main public utility sector. This allocation pattern also shows the concern of Government that growth in the manufacturing and allied sectors can only be promoted and accelerated through improved and expanded infrastructural facilities.

In essence, Government has continued to give a great deal of attention to the constraints posed to project implementation by inadequate physical infrastructural facilities. A great deal of capital investment in infrastructural development is, therefore, continuously being generated through budgetary allocations and foreign loans from such bodies as the World Bank and its affiliates and European Investment Bank. The Nigerian Electric Power Authority (NEPA) is continuously being assisted with funds for the purchase of equipment whilst inadequate water supply is being tackled through huge investment by Government. Similarly, the infrastructural inadequacies arising from poor postal and telecommunications system are being gradually removed through intensive capital investments in telecommunications networks. Telecommunications Equipment Manufacturing is presently one of Government's listed priority industries. Foreign investments in telecommunications both in capital and equipment are increasing whilst local investors are being encouraged.

Special Problems:

However, and inspite of the efforts by Government to make these various public utilities efficient and effective, a number of problems continues to plague these organisations. The existing plethora of problems can be subsumed under the following:-

- inadequate power supply to meet the demand of a rapidly growing economy;
- excessive reliance on large-scale hydro power (Kainji hydro electric power station alone accounted for about 50-70% of total energy generation in 1975-79);
- frequent power failures and load shedding (rate of energy loss estimated at 20% between 1975 and 1980 and losses due mainly to long distances between generation stations and load centres as well as poor maintenance of transmission facilities and sub-stations);
- overloaded distribution facilities (Use of single circuits to transmit bulk power over long distances);
- inadequate maintenance facilities;
- dearth of experienced and competent staff;
- inadequate funding and poor financial management;
- underpinning philosophy (service-oriented) on which it exists;
- lack of co[illegible]ration from the public (consumers) through damaging of cables, transformers, meters, etc.
- unwillingness by many consumers to settle their bills for services enjoyed;
- illegal connections or tappings by some consumers and lack of co-ordination between industries and NEPA having regard to requirements, establishment, etc.
- inadequate motivation of workers;
- lack of commitment by many of its workers even when well motivated;
- problems arising from its harmonization with the civil service;
- inadequate supply of essential working tools and materials since these tools/materials are all

- dearth of sufficiently accurate data on economic factors on which to base proper forecast of power demands.

(ii) Transport

- demand management, i.e., dearth of experienced and competent staff to promote operational efficiency;
- poor financial management;
- inadequate funding for maintenance.

(iii) Water

- inadequate supply and distribution network;
- low quality of water itself;
- inadequate funding;
- shortage of technical and supervisory manpower (resulting in inadequate maintenance and incessant break-down of water supply system);
- lack of cost recovery measures (that would have permitted more facilities to be provided).

(iv) Communications

- inadequacy of technical and engineering staff;
- non-standardization of equipment;
- inadequate maintenance and supporting facilities;
- institutional and organisational problems;
- incessant damage to external line plants, cables and ducts in urban centres by the public;
- unwillingness of many consumers to settle their bills for services enjoyed.

The structutal inadequacies of the various public utilities highlighted above must, of necessity, create special problems for the industrialists, the business community and the consuming public at large. Such problems include:-

(i) Equipment damages and underutilisation of capacity arising from frequent power interruptions.

(ii) Heavy capital outlay on procurement of standby generators and transformers with attendant consequences on production overheads and related high price levels of locally produced goods and services.

(iii) Further capital outlay on sinking boreholes, water tankers and radio communication equipment arising from inadequate water supply and unreliable postal and telecommunications facilities with consequent increases in production overheads and attendant high prices of locally produced goods and services.

(iv) Continuing 'inefficient' and 'ineffective' use of our scarce foreign exchange earnings for the procurement of necessary equipment in items (i) - (iii) above since most (if not all) are not produced locally and must therefore be imported.

Government is, however, aware of all these problems and has initiated measures to minimize the disincentiveness of the structural inadequacies of the publicly-owned utilities. First, in its recently published Nigerian Industrial Policy and Strategy: Guidelines to Investors (Government Press, 1980), Government has accepted, as a matter of policy, to cooperate with private entrepreneurs to minimize the adverse effects of current infrastructural inadequacies such as irregular electricity and water supplies and poor access roads by proposing tax concessions, to offset substantially, necessary expenses incurred in providing such facilities. The concessions will, however, apply only to industries located in the hinterland and will also take into account the cost of transportation of imported raw materials required by such industries. Secondly, Government has also recently accepted the recommendation that public utilities like the Nigerian Electric Power Authority and the Post and Telecommunications Department (which, by nature, are economic organisations) should be self-financing and efforts are now being made to restructure them to make them

self-financing and cost-effective. Finally, another form of infrastructural facility which is often not so apparent as the other physical infrastructures already dealt with in this paper, is banking. In this connection, it should be pointed out that Government, as a matter of policy, has already taken steps to increase banking services in the rural areas by directing existing banks to establish branches in the rural areas. The essence of this directive is to provide easy access to loanable capital in the rural areas in order to facilitate and accelerate the development of entrepreneurship in these areas. Government, itself, has established a number of banks, notably, the Central Bank of Nigeria (CBN), the Nigeria Industrial Development Bank (NIDB), the Nigeria Bank for Commerce and Industry (NBCI) and the Nigeria Agricultural Credit Bank whilst some of the State governments have also established banks in their various areas of jurisdiction. These banks, including those in the private sector, are supposed to be source of investment capital for integrated development.

Financing

The offshoot of the foregoing is that money must be available for increased investment in infrastructural [illegible] development. The source of financing and its utilisation will depend, to a large extent, on the types of project envisaged. Generally, the sources of capital for investment are:-

- Equity capital
- Development Agencies
- Aid Finance
- Export Credits
- Local Currency Markets
- Medium-term Euro-Currency Market
- International Capital Market

However, since infrastructural facilities are publicly provided and owned in this country, investment in infrastructural development will, of necessity, be undertaken by the Government.

The sources of financing by Government are usually through:-

- Budgetary allocation
- Foreign loans from friendly countries
- Euro-Currency market
- International Capital Markets
- Multilateral financial sources such as World Bank, Inter-American Development Bank, African Development Bank, European Investment Bank, Asian Development Bank, etc.

Multilateral financial sources can be used for co-financing (in conjunction with one or all of the above development banks) infrastructural projects such as express roads, rail roads or electric power supply grid. Soft loans can also be obtained from such sources for a period of twenty years with five years grace period at non-subsidized interest rates. The World Bank can also be a source of loans for infrastructural projects of high priority in the nation's development programme.

However, since capital is scarce, only economic considerations are relevant for granting such loans. The other conditions for World Bank loans are as follows:-

- loans only to Governments (or under Government guarantees)
- reasonable rate of return
- financing of foreign exchange costs
- non-subsidized fixed interest rates
- long-term loans
- exchange risks in different currencies
- international competitive bidding for procurement
- loans to credit-worthy borrowers only

These same conditions also apply to loans from other development banks and Agencies.

It would, at this stage, be useful to enumerate some simple principles to be borne in mind when scouting for investment fundings. Some of these basic principles are as follows:-

- maximization of long-term debt
- maximization of fixed rate financing
- maximization of foreign exchange exposure
- minimization of re-financing risks
- minimization of interest payments whilst construction is in progress.

Costs and Benefits

Projects are rarely conceived and implemented in isolation. They are normally linked to the development programme of the sector or subsector to which they fall, as well as the overall development of all the sectors of the economy. The generally accepted norm is that since capital is scarce, it must be put into the most effective use to assure possible identification of all accruable direct and indirect costs as well as the direct and indirect benefits. It is in this connection that special attention is usually given to the criteria employed in the measurement of economic costs and economic benefits including the validity of the values of the parameters used in measuring social costs and social benefits.

It is, however, not always possible to fully document the costs of an investment in infrastructure. This is because estimated costs will largely be based on experience and quotations furnished by contractors. The level of accuracy of the estimate may, however, be defined by stating the standard of the documentation of the project under consideration. As a guide, such documentation in a feasibility study, for example, will include the following items of estimate:-

| Items of Documentation | Level of Accuracy of Estimate to be used |
|---|---|
| Maps | 1 : 2000 |
| Soil Investigation | Preliminary |
| Layout (Area) | Approximate |
| Process Diagram | Optimized (but not final) |
| Materials/Balance | Optimized (but not final) |
| Layout (Plant) | Preliminary |
| Process Equipment | Optimized (but not final) |
| Buildings | Conceptual |

The cost/benefit study of a project is essentially an economic appraisal focusing on the commercial and financial viability of the project. This appraisal is, however, subject to certain distortions of a competitive market structure brought about by tariff and quantitative restrictions, unrealistic exchange rates, government control of interest rates and prices, and monopolistic influences and labour union activities on real wages. The commercial appraisal examines all the arrangements and procedures for the procurement of goods and services required for the project and also arrangements for obtaining the necessary inputs including measures for the disposition of the expected output. The ultimate objective is to ensure that the best value is obtained for the money spent on the project. The financial appraisal, on the other hand, examines the amount of money required for project take-off and the sources of such funds and the probable operating costs and revenues and the financial viability of the project. These consideration must, however, take cognisance of the social benefits derivable from investment in infrastructures especially since these benefits cannot be expressed in quantitative monetary terms. The cost-effectiveness of infrastructural projects can always be achieved by relating the dimension and choice of technology to the demand forecast and ensuring that the capability of the community/society to afford the chosen least-cost investment is not in doubt.

The essence of a cost/benefit evaluation of infrastructural projects is to ascertain and be convinced that the development of such infrastructures is likely to contribute significantly to the overall socio-economic development of the country. Thereafter, there is also the need to be convinced that the expected contribution is likely to be great enough to justify the use of scarce resources such as investment capital (domestic and foreign), managerial talents (domestic and foreign) and skilled labour, etc. Moreover, in a situation

where there is an existing Development Plan, the infrastructural project must be evaluated to ensure consistency and re-assurance that the project is being implemented within the priorities set for the economy. The assessment of its contribution will therefore be determined through the process of assigning market values to the benefit and cost components, that is, values will be assigned to direct benefits, indirect benefits, scrap value at terminal year, capital costs, operating costs, and indirect costs.

Following from the foregoing, it is apparent that the benefits derivable from investment in infrastructures are usually not quantifiable. It is not very often useful to consider the willingness of users to pay as an estimate of project benefits since the true value of infrastructures to the consumer is more often than not greater than the willingness to pay - the difference is usually referred to as 'consumer surplus'. Moreover, the social and financial benefits accruable from investment in infrastructures are manifold and include socio-economic integration of rural and urban communities, increased standard of living, creation of employment opportunities, increased industrial and agricultural production levels, increased sources of revenue (rent and service charges), and conservation of foreign exchange earnings. The proposition that is, in effect, being put forward in this paper is that investment decision in respect of infrastructures should focus directly on the qualitative assessment of the benefits derivable therefrom. The price mechanism may, however, be employed to achieve optimum use of infrastructural factors of production within the framework that the expected benefits from the infrastructures must, at least, be equal to their costs.

APPENDIX 1

## CONSIDERATIONS FOR A FINANCING PLAN

- RATIO OF DEBT TO EQUITY
- SOURCES OF EQUITY AND LOAN FINANCE
- LOCAL BORROWINGS CONTRA EXTERNAL
- PROPORTIONS OF LOAN FINANCE TIED TO SUPPLY OF IMPORTED GOODS AND SERVICES
- ASSUMPTIONS ABOUT INTEREST RATES
  GRACE PERIODS
  AMORTIZATION PERIODS
  BANK CHARGES
- WORKING CAPITAL REQUIREMENTS
- INTEREST UNDER CONSTRUCTION PERIOD
- FOREIGN CURRENCIES

## EQUITY FINANCE

HIGHER RISKS - MORE EQUITY FINANCE

SOURCES: - INITIATOR OF PROJECT
- PURCHASER OF THE PRODUCTS
- SUPPLIERS TO THE PROCESS
- SUPPLIERS OF EQUIPMENT TO THE PRODUCT

APPENDIX 2

## RISK EVALUATION

- SUPPLIER'S COMPETENT RISK
- COOPERATION PARTNER'S COMPETENT RISK
- SUBSUPPLIER'S COMPETENT RISK
- FORCE MAJEURE RISK (NON POLITICAL)
- TECHNICAL RISKS
- POLITICAL RISKS
- SOLIDITY RISKS
- CUSTOMER'S COMPETENCE RISK
- CURRENCY RISKS
- CALCULATION RISKS
- INFLATION RISKS
- CONTRACTUAL RISKS

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| | Expenditure accumulated to date | Commitment incured to date | Expenditure required to complete | Anticipated final cost (total forecast) | Budget | Difference 4 ./. 5 |
| INFRASTRUCTURAL PROJECT | | | | | | |
| Power station | | | | | | |
| Power distribution | | | | | | |
| Gas piping | | | | | | |
| Communications | | | | | | |
| Service & Utility | | | | | | |
| Staff | | | | | | |
| Notes : | | | | | | |

**ANNEX** 2: Guest lecture:
"Evaluation of Technology Transfer Agreements"
given by guest lecturer:
Mr. F.J. OKONO - AG Director - National Office of Industrial Property (NOIP)

# EVALUATION OF TECHNOLOGY TRANSFER AGREEMENTS

Lecture given by:-
MR. F. J. OKONO - AG. DIRECTOR - NOIP AT
THE TRAINING COURSE ON
INDUSTRIAL PROJECT PREPARATION EVALUATION AND FINANCING
ON 12TH OCTOBER, 1983 AT NIDB, LAGOS.

1. ## I. INTRODUCTORY REMARKS

It gives me great pleasure to be in your midst on this occasion and more so, to share with you my thoughts and experiences on this important subject. I wish to congratulate the organisers of this Course for thinking it fit to request the National Office of Industrial Property which is an Agency of the Federal Ministry of Science and Technology to speak to you on its activities in this area which is of national concern towards the current technological race. There are several reasons for believing that the activities and experience of the National Office of Industrial Property might be of interest for you who will be responsible for preparation, evaluation and designing financial schemes for industrial projects. The acquisition of foreign technology constitutes quite often an essential element of the industrial project and, therefore, that aspect has to be carefully taken into account in the process of project preparation and evaluation. I have been told that you have learned during the course basic methods used for evaluation of foreign technology acquisition. Therefore, I am freed from repeating or continuing classroom approach. I would rather share with you the experience of the National Office of Industrial Property in the application of these techniques, in the process of evaluation and registration of technology transfer agreements between Nigerian enterprises and foreign partners.

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The National Office of Industrial Property is one of the youngest agencies in the Federal administration. One of the essenti problems which still has to be solved is the lack of awareness of the existence of the National Office and its activities among industrial enterprises, financial institutions and even state administration. I sincerely hope that this opportunity of meeting you represent important banking and government institutions from various states will help in closing this information gap.

2. The presentation will be divided in two parts. In the first part I would like to outline in the first instance the legal and institutional framework for controlling technology transfer in Nigeria. Next, I will present the scope and methods of evaluation of technology transfer agreements currently used in the National Office of Industrial Property. I shall conclude by providing an outlook for the future expansion of the activities of the National Office and suggesting practical forms of co-operation and exchange of information between various institutions participating in the process of preparation and evaluation of industrial projects with foreign technological inputs.

In the second part we shall follow more pragmatic approach. I have asked one of my officers who is directly involved in evaluating technology agreements - Mr. Abubakar to present a case study so that you may see the practical application of the evaluation methods oto be outlined in the first part.

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## II. LEGAL AND INSTITUTIONAL FRAMEWORK FOR CONTROLLING TECHNOLOGY TRANSFER IN NIGERIA

### 1. Rationale for government intervention in the area of technology transfer

3. In view of the fact that some people consider that contractual arrangements for the acquisition of foreign technology should be left exclusively for the private contracting parties, let me dwell a little more on the rationale for government intervention in this area. Two main groups of reasons provide the rationale for Government interventi in the technology field. Firstly, given the fact that technology is being sold and purchased in very imperfect markets, intervention is justified in order to minimise the misallocation of resources that results from monopoly pricing, and from discriminatory and restrictive business practices. Secondly, as a consequence of the imperfect appropriability which characterises the knowledge creation process, there is a built-in tendency for the system to allocate less than the optimal amount of resources to the creation of new technology. These two reasons amongst others reflect a need for alternative ways of Government regulation designed to bring the economic system somewhat closer to an optimal position.

With respect to market imperfections, research work of recent years has shown that the list of restrictive business practices is quite substantial, ranging from discriminatory royalty rates to purchase tie-in clauses dealing with capital equipment and raw materia and passing through export restrictions and free grant-back of adaptive know-how to the original licensor.

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During the recent years, a number of developing countries have sought to counteract some of those restrictive business practices, through the creation of Government agencies responsible for the examiniation and approval of technology contracts signed by private parties. Ther is no question that in an area so much affected by oligopolistic and monopolistic practices, a public screening mechanism of some sort would be useful in redressing the unequitable business practices. The solution that emerged in this country after several years of hard work and consultations with such well meaning organizations as UNIDO, UNCTAD, the ECA, is the establishment of the National Office of Industrial Property in 1979, to regulate the terms and conditions for acquiring foreign technology. Similarly in many other developing countries, regardless of whether special legislation regulating in-fl of technology has been introduced or not, national registries for regulation of transfer of technology have been created or going to be created.

2. Legal framework and the functions of NOIP

4. Let me turn now to the experience of Nigeria with respect to the regulation of technology transfer. As I mentioned already, the major breakthrough in that field took place in 1979, with the establishment of the National Office of Industrial Property by Act No. 70 of 1979 in the Federal Ministry of Industries as a mechanism to regulate technology transfer in Nigeria. With the creation of a Federal Ministry of Science and Technology in the past administration, whose functions include the promotion and administration of technology transfer programmes,

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Mr . President transferred the National Office in May, 1980 from the Federal Ministry of Industries to the New Ministry as the supervising Ministry. The National Office of Industrial Property is one of the main instruments to carry out the Nigerian Technological Policy; which in turn is a basic expression of the overall development policy of the Federal Government. Nigerian Technological Policy has several goals that are being considered when a transfer of technology agreement is being analysed. The principal goals of these technological policies to be achieved are the following:-

(i) To encourage the flow of technology into the country in order to strengthen the industrial development;

(ii) To encourage domestic enterprises to acquire foreign technologies that may be suitable to the indigenous requirement: In this sense, it is considered particularly important that the technology contributes to the creation of employment to fully use Nigerian labour forces;

(iii) To assist Nigerian enterprises in the selection of foreign Technology;

(iv) To strengthen the negotiating capacity of Nigerians so that they may obtain the appropriate technology they need, at the best terms and conditions, especially concerning the price;

(v) To achieve a more efficient process for a rapid absurption and assimilation of foreign technology by Nigerian technicians;

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(vi) To properly adapt foreign technologies to the requirements of the local markets;

(vii) To gradually develop local technologies;

(viii) To encourage future exportation of the locally developed technologies to other markets, especially those of the neighbouring countries.

5. The National Office of Industrial Property as a regulatory body is aimed at supervising the selection and acquisition of foreign technology, as well as the forms in which the acquisition is materialized, while at the same time encouraging the most efficient use of the technology so obtained for the benefit of the national economy. More specifically, the functions of the Office include:-

(a) the encouragement of a more efficient process for the identification and selection of foreing technology;

(b) the development of the negotiating skills of Nigerians with a view to ensuring the acquirement of the best contractual terms and conditions by Nigerian partners entering into any contracts or agreement for the transfer of foreign technology;

(c) the provision of a more efficient process for the adaptation of imported technology;

(d) the registration of all existing and new contracts or agreements entered into for the transfer of foreign technology to Nigerian partners.

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## III. SCOPE AND METHODS OF EVALUATION OF TECHNOLOGY TRANSFER AGREEMENTS USED IN THE NOIP

### 1. Types of agreements being evaluated and registered by NOIP

6. A transfer of technology contract is a legally binding instrument It contains the will of the parties thereof. It is, properly speaking an agreement reached among two parties: the supplier or transferor and the recipient or transferee.

The contract may be seen as a legal document. But it is also the way in which a commercial transaction took place. The contract is a unity in itself. At first the analysis should try to classify the contract into one or several categories established in Section 4(d of the Act No. 70. These categories are:

(i) the use of the trade-marks,

(ii) the right to use patented inventions,

(iii) the supply of technical expertise in the form of the preparation of plans, diagrams, operating manuals or any other forms of technical assistance of any description whatsoever,

(iv) the supply of basic or detailed engineering,

(v) the supply of machinery and plant, and

(vi) the provision of operating staff or managerial assistance and the training of personnel.

This is a very important task to be executed because the contracts should be treated and analysed in a different manner in accordance with its nature.

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It happens very frequently that a single contract could cover several types of these categories mentioned in Section 4. For instance, a contract for the authorisation to use a trade-mark frequently involves also the supply of technical know-how or technic assistance.

## 2. General criteria used for the evaluation of technology transfer agreement

7. In view of the scarcity of time it would be difficult for me to conduct detailed presentation of the evaluation techniques applie to each type of technology transfer agreement. I would rather attem to outline generall rules and procedures used by the National Office and point out the most important aspects of the evaluation process.

The overall purpose of the evaluation once the contract has been classified is to carry out a social cost benefit analysis to be able to get to the final conclusion about if the commercial transaction involved in the agreement do comply with the goals of the Nigerian Technological Policy.

To be able to realise the so-called social cost benefit analysis NOIP examines the agreement under three different points of view: the legal, economic and technicel approach. Each of these different analysis is being done by highly experienced and trained personnel and in a very careful manner.

Some of the criteria that must be used to peroform the social cost benefit analysis are:

a) Type and nature of the technology to be transferred.

Special reference has to be made concerning.:

a) The royalty payments (cost of the Technology):

b) The way in which the agreement contributes to the improvemen of national technological capabilities.

c) The existing relationship among the parties involved, i.e. a parent-subsidiary agreement.

e) The other contributions or disadvantages of the agreement in the light of the national interest.

3. Novelty and availability of technology in Nigeria

8. According to the Section 6 (2) (a):

Director (of NOIP) shall not register ' any contract or agreement:

"where its purpose is the transfer of technology freely available in Nigeria."

This provision means that the NOIP should not accept those agreements in which the transferor is trying to sell a technology that may be obtained without a payment, for instance, in a technical book, because it is a well-known process that has been applied for many years. This section must be applied, and the contract rejected by NOIP when:

i) The scope of the agreement is the exploitation of a patented invention but the patent has already expired and then is no longer valid in Nigeria.

Frequently, patent licences also cover know-how. In that case, the NOIP is expected to obtain from the parties an amendment of the agreement and a reduction of royalty payments to supress the granting of the use of the null and void patent and authorise only the supply of the technical know-how.

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ii) It referes to foreign technical know-how that a local research institute or university may provide to the Nigerian enterprise at a lower cost or freely.

iii) It involves technical knowledge that any Nigerian technician could provide.

4. The price of technology

9. Section 6(2) (b) of the ~~Decree~~ Act No. 70 stipulates that Director shall not register the agreement:

> "where the price or other valuable consideration therefore is not commensurate with the technology acquired or to be acquired."

Without any doubt this is the most important provision among Section 6 and among the law itself. It calls for the economic analysis of the royalty payments included in the agreement.

The question of payments, involved in transfer of technology agreements depend heavily on the technology that is going to be supplied, the technical assistance required to support the transferee's activities, or the degree of complexity of the patent, or the prestige of the trademark that are going to be use.

Although there are not general rules concerning the adequate level of payments but neverthless, there are some good rules to be taken into account where a transfer of technology agreement is going to be analised.

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The rules are the following:-

i) It is very important that the base and the formula to calculate royalty payments is clearly specified in the contract. The person that is analysing the agreement usually demands any aexplanation needed from the parties as to very clearly understand all the payments involved in the agreement. Wide and open formulaq to calculate payments must be rejected.

ii) It is very important that the contract clearly provides that Nigerian taxes due on royalties are the responsibility of the transferor. When the contract establishes all taxes to be paid by the transferee it is being rejected.

iii) Calculation is being done by NOIP considering the total flow of payments involved in the contract, including those to cover technical services or technical assistance.

To determine the total flow of payments involved in a transfer of technology agreement, the following aspects are considered:

a) The form and time in which the payments are going to take place.

b) Projected volume of sales or production during the term of the contract;

c) The duration of the agreement;

d) The other specific payments involved, for instance, the ones related to the visit of technical personnel coming from the transferor's plant;

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e) The dates when payments should take place.

Once NOIP has the total flow of payments already calculated, the first step of economic evaluation has been completed. NOIP has then the "cost" of the technology.

Now NOIP carefully analises "the benefit" that the agreement shall bring to the Nigerian enterprise (recipient party) and to the national economy.

10. How to establish the contribution of a concrete technology as such? How to define the "real" price of the technology and it's "social" value?

To answer those questions the following has to be done:

i) To establish the "on-going" international price of that technology;

ii) To establish the price of similar technologies acquired by Nigerian enterprises.

iii) To take into consideration the rate of royalty payments in the industrial sector concerned.

iv) To establish the impact of royalty payments on the profits of the Nigerian enterprise (recipient party).

With all these elements put together, NOIP has a tentative picture of the "value" of the technology in terms of "private economy" as such.

## 5. Social value of technology

Concerning the "social" value of the technology, the following elements are taken into consideration:-

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i) The importance of the technology agreement for the national economy, considering specially the industrial sector involved. It is a rather different situation when the technology involved in the agreement is devoted to the production of "capital goods" than when it is going to be applied to manufactured "cosmetics". A different treatment should be given to those contracts.

ii) If the products to be made are "consumption" goods or industrial imputs.

Again it is important to support the industrialisation process of the country and to give priority to those agreements that contribute to obtain that purpose.

iii) If the production of goods locally will substitute imported items.

iv) If the products to be made with the technology involved are going to be exported.

v) If a new plant is going to be built up.

vi) If new jobs are going to be created.

vii) If the products to be manufactured are going to enhance the living standards of Nigerian people.

viii) If the establishment of the plant is not going to pollute the atmosphere or the weather.

ix) If the new industrial activity is not going to substitute Nigerian products already being manufactured and with good quality, because of its foreign origin, without any benefit for the country's national economy.

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These are some of the questions that NOIP's staff should answer when analysing a technology transfer agreement.

In order to determine if the payments involved are appropriate, it is necessary to examine them at the scope of "social cost benefit analysis", and to compare the "costs" (royalties to be paid, and other burdens) with the "benefits" the agreement should bring to the country. As a matter of principle, NOIP discourages the whole concept of minimum royalty payments because it involves a burden on the development of the contract and also provides to the licensor with a guarantee of the receipt of a fixed amount independently of his engagement in the successful development of the contract and of the performance of the technology transferred. Although the basis of the calculation of royalties are generally net sales, in some instances, NOIP has changed net sales in the contract into other basis deemed more adequate to reflect the interest of the licensee and the needs of the economy. Such basis include local value added, exports or profits. Such a flexible approach has proved useful for a country in our stage of development.

## IV. ASSESSMENT OF THE RECENT EXPERIENCE AND THE RESULTS OF NOIP INTERVENTION

12. Although the National Office of Industrial Property reached its operational stage only towards the end of 1982 some concrete results are already visible. Since that time approximately, 250 contracts have been evaluated. The concrete achievements can be related in the first instance to the decreasing of payments for technology acquired by Nigerian enterprises.

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The intervention of NOIP contributed also to the shortening of the duration of technology agreements which often exceeded the time limits necessary for the proper assimilation of imported technology= by the local partner. Some other effects are difficult to measure in financial terms but they are of utmost importance for achieving full advantages from technology transfer in the long run. These are related mostly to the elimination of the various restrictive clauses found in technology agreements presented for NOIP's approval. Most often these are limitations to exports, tie-in clauses and the failure to observe reciprocity in rights and duties.

13. It has to be pointed out in that respect that Nigerian companies are often seeking NOIP's guidance and assistance at the stage when the agreement with foreign partner is being negotiated. This proves to be most effective in view of the limited negotiating capabilities of the Nigerian enterpreneurs in the area of technology transfer.

## V. FUTURE DEVELOPMENTS

14. It is gratifying to note that the objectives which had been set by the Federal Government in introducing the measures to regulate the acquisition of foreign technology have to a large degree been met in spite of the relatively short existence of the Office. In the first place, the establishment of the Office had made it possible to know the nature of technology flow, the countries of origin and the sectors for which the imported technology is intended. This knowledge has contributed significantly towards the identification of priority sectors and the adoption of measures to promote technology innovations. It is to be mentioned too that the work of the Office in giving guidance in the wording of contracts/agreements has been found useful by most companies and organizations as seen in the fact //

subsequent contracts from these organisation have been improving in their form and tending to ensure a balance between the rights and obligations of the partners and greater clarity in their definition. In view of the above the regulatory function of NOIP should be further strengthened. In the near future, however, new areas of NOIP's activities will gain importance. In the first place close contacts with Nigerian enterprises which are planning or are already engaged in the negotiations of technology agreements are being established. In an effort to further improve the negotiating capacities of Nigerian enterprises, the Office is currently working on the guidelines to guide enterpreneurs while negotiating technology agreements with their foreign partners. Such guidelines will also greatly enhance the quality of technology agreements that are submitted to the Office for registration. Furthe eactivities in that field include specialised workshops on negotictin technology agreements at the enterprise level. NOIP also plans to lanch regular publication for the Nigerian enterprises aimed at strenghtening their negotiating capabilities and more effective utilization of imported technology.

15. The registration of technology agreements should be merely treated as the beginning of technology transfer process. The most important stage comes later when the foreign technology is being properly assimilated by the Nigerian partner. Therefore, NOIP will further extend its functions towards continuous monitoring of the implementation of technology agreements being registered.

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16. In the recent period, substantial effort has been made to co-ordinate technology transfer regulation within the framework of Nigerian Science and Technology Policy. Since the substantial share of technology transfer agreements involves foreign equity participation there is a definite need for co-ordination of policies and the activities of relevant government agencies in these two inter-related areas. In the long run, technology acquisition should contribute to the expansion of manufactured exports from Nigeria. At the moment the Nigerian enterprises buying foreign technology are almost entirely oriented towards satisfying local demand. A definite step should be taken by the various government agencies and institutions in colloboration with NOIP in order to expand manufactured exports based on acquired technology. This in turn will lead to the improvement of the balance of payments ~~related to the improvement of the balance of payments~~ related to the transfer of technology programme.

## VI. INTERNATIONAL CO-OPERATION

17. My presentation would not be complete without outlining the role of international co-operation among developing countries and the assistance provided by the United Nations Industrial Development Organization (UNIDO) for the establishment of the National Office of Industrial Property. In this connection, I wish to mention that UNIDO has provided immense assistance towards the establishment and effective functioning of the Office.

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This year alone, UNIDO has provided five foreign experts from similar offices in other developing countries to assist in the training of the newly recruited staff. It may be mentioned here that even at this moment, one of the UNIDO experts from Poland is with us. The Office has found the contributions of these experts extremely useful. The regulatory functions of the National Office of Industrial Property are being substantially enhanced through training programmes, publications on licensing matters, and access to external source of information like UNIDO Technological Information Exchange System (TIES) and bi-lateral co-operation schemes with similar Offices in other countries.

## VII. CONCLUDING REMARKS

18. I would like to conclude my presentation by offering specific suggestions for possible co-operation between the National Office of Industrial Property and institutions you represent. Since we are going to be involved in the evaluation of industrial project although looking on different sides there is a room for exchange of experience and results of analyses conducted. I would therefore, suggest that while evaluating industrial projects involving acquisition of foreign technology, you shall make an enquiry whether relevant agreement has been already registered or submitted for registration to the NOIP. In such cases the results of our analysis may prove useful for the evaluation of the entire project. In turn we shall make necessary arrangements for using for our purposes the results of evaluation conducted by your institutions. The co-operatic and excahange of experience may have more general character and encompass methodology and techniques applied for evaluation.

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In that respect, I would like to emphasize that you are always welcomed in the National Office of Industrial Property.

**ANNEX** 3: Guest lecture:
Case Study of Evaluation and Registration of Technology Transfer Agreements

# A CASE STUDY OF EVALUATION AND REGISTRATION OF TECHNOLOGY TRANSFER AGREEMENTS

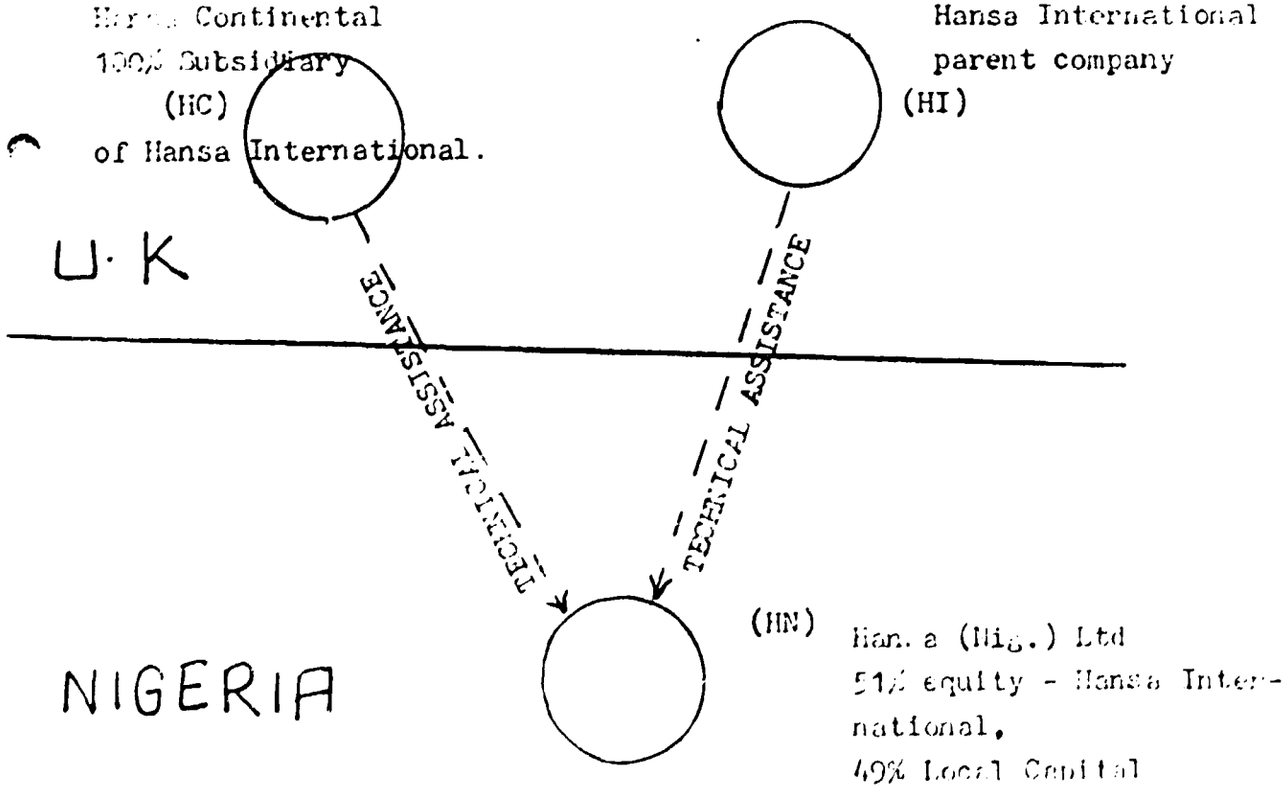
(Prepared by the National Office
of Industrial Property)

Lagos, 1983.

TECHNICAL ASSISTANCE AGREEMENT BETWEEN HANSA INTERNATIONAL LIMITED AND HANSA CONTINENTAL LIMITED BOTH OF U.K. AND HANSA (NIGERIA) LTD

1. Hansa International Limited is a United Kingdom based Rubber products and plastics Manufacturing Company. Hansa Continental is its wholly-owned subsidiary also based in U.K. It has in its possession some of Hansa International's know-how in the manufacture of plastics and rubber products. The two constitute the licensor under the above agreement.

Hansa (Nigeria) Limited is a private joint-venture enterprise incorporated in Nigeria with 51% Foreign Capital and 49% Local Capital. Hansa (Nigeria) Limited entered into separate agreement, with both Hansa International Limited and Hansa Continental Limited under which both shall supply it with all information processes and inventions together with the sole rights to manufacture and deal in various rubber products and plastics. Hansa International on its own and through its subsidiary (Hansa Continental), following the date of the agreement grant to Hansa (Nigeria) Limited registered user rights in respect of Trade Marks and Registered Designs. The triangle below depicts the know-how supply patterns.



---- - Agreement between Hansa International and Hansa (Nigeria) Limited.

---- = Agreement between Hansa (Nigeria) Limited and Hansa Continental U.K.

The agreement between Hansa (Nigeria) Limited and Hansa Continental draws equal fees to that between the former and Hansa International.

REMUNERATION

In consideration of the licensed know-how information and other grants Hansa (Nigeria) Limited is obliged to make the following payments:-

(i) 4% royalty on P.B.T

(ii) 2% on net turn over for use of Industrial Property Rights.

(iii) 4% buying commission on f.o.b. invoice price on raw materials.

(iv) Settle all forms of insurance, freight and registration charges incured in the process of implementing the agreement

Under the second agreement, with Hansa Continental, Hansa (Nigeria) Limited is also obliged to make exactly the same payment as above.

From the attached fees capitalization sheet, the two sets of payments contitute 8% each of licensor's profit. And since both sets of payments are made against the same financial figure of the licensee, the aggregate payment becomes 16%. Given the licensee's discounted profit figure ₦13,666,070 the licensors share of it is ₦2,186,912. On its raw material import avarage figure of ₦10,000,000, 4% buying commission due to the licensor constitute ₦400,000. By the time other charges on insurance, freight, registration fees, and training of its personnel are taken in to consideration, the total commitment annually at the instance of the licensor would amount to ₦4,000,000.

3. TAXATION

The two agreements provide that all payments due to Hansa International Limited shall be free of "Withholding Charges" "taxes" and "deductions whatsoever". This is because Hansa International shall pay same in U.K. However if it is necessary to do so the agreement obliged Hansa (Nigeria) Limited to settle such payments on its own.

4. DURATION

The first agreement entered by Hansa (Nigeria) Limited and Hansa International of U.K. was twenty two years ago, for two equal terms of ten years each. The present one is the third. During these periods, from Hansa (Nigeria Limited's records, the national content (Value Added) of its products grew by 5%. Its raw material import figure grew by 300%, while its export figure remains at zero.

5. GOVERNING LAW OF THE AGREEMENTS

As provided for in the two agreements, the governing law of the agreements shall be the law of England. Despute shall accordingly be settled in U.K. in accordance with the arbitration law of England.

6. MISSING PROVISIONS

The agreements made no provision for the following clauses:

(i) Clause warranting the licensed information processes.

(ii) a training programme clause geared towards the development of the skills of Nigeria.

(iii) a research and development programme geared towards the development of local raw materials.

7. RECOMMENDATIONS BY NOIP

The agreements containing the provisions such as those stipulated above and the non-inclusion of some vital ones, would only enhence the maximization of the returns on the licensor's (Hansa International Limited) know-how at the expense of both the

joint venture partners and the national economy. The effective control of the enterprise would also be difficult since raw materials used by the firm and the law governing the agreements are as foreign as the know-how itself. The National Office of Industrial Property playing its role of screening and registration of Technology Agreements made the following recommendations:-

(a) that a clause be incorporated in to the agreement warranting the licensed information process and inventions for the manufacture of the licensed goods. This clause shall make Hansa International liable to all loss and/or damages suffered by the licensee as a result of faulty information processes, supplied by it.

(b) that a comprehensive training programme for Hansa (Nigeria) Limited's personnel be incorporated into the agreement. The programme among other things should state the field, calibre of staff, and duration of the such trainings.

(c) that a research and development clause geared towards the development of local raw materials be included into the agreement in view of the fact that substantial part of such materials would be produced locally.

(d) that a clause granting royalty free improvements to the licensee be incorporated with the agreement in view of the changing nature of technology.

The parties to the agreements have accepted this and the other three recommendations above.

(e) the office further recommended that the two agreements be merged into one or the licensor proof that two distinct information processes are needed to manufacture the rubber products and plastics respectively. And if so, to justify that both processes involve the identical technology thereby drawing identical remuneration. To these observations, the licensor accepted the merger of the two

agreements against single set of remuneration. By the intervension of the Office, half of the nearly ₦4 million remitted has been saved.

(f) that all fees earned in Nigeria should be taxed according to the Nigerian tax law. In the opinion of this Office Nigeria equally needs Foreign exchange through taxation just like U.K. The parties to the agreement had accepted this recommendation

(g) that the duration of the agreement be reduced from 10 to 2½ years, since from records available, the durations (1962-83) played little role in getting the technology adapte in Nigeria. The parties to the agreement had agreed to the reduction of the term of the agreement but not to 2½ years in view of recommendations under a, b, c and d above. According to them, a period of five years is needed. A term of 5 years therefore was approved for the agreement.

(h) that the law governing the agreement as well as despute arising thereof shall be the Nigeria law. This recommendatio was accepted and effected accordingly.

CONCLUSIONS

From the foregoing it is evident that foreign Companies typical of the ones under study, by down-playing the relationships of parties to technology agreements and making ambiguous provisions are able to maxfmize their remuneration to the detriment of the local venture partners and the nationa economy. For instance, the know-how to be supplied by the two licensors in question are vaguely stated as "all information process and inventions together with the sole right to manufacture and deal in various rubber products" and "plastics". The subsidiary Company and the parent firm under this arrangement also assumed distinct identities thereby justifying the remuneration attached to the two agreements.

NOIP in the evaluation of the agreement was able to determine the contradiction and ambiguities in the said agreements and accordingly called for their merger and ammendment. After a series of consultation with the representatives of the Companies concerned, the agreements were merged and amended and approved thereby saving some foreign exchange in the tune of ₦2 million, in addition to the adequate protection made for the licensee.

Bearing in mind that from a single agreement this Office could save ₦2 million, the country aught to have lost millions of naira in foreign exchange to foreign Companies before it was recently established. Furthermore the Office was able to get stringent provisions such as those regarding supply of raw materials, governing laws and duration of the agreement relaxed. This, with the incorporation of research and development, and training programmes geard towards the development of local raw materials and the enterprise's personnel would enhence the adaptability and profitability of the venture for the larger benefit of the economy.

At this juncture it is safe to say that, while technology transfer Agreements can be a vehicle through which a country could have immediate access to advance means of production and control over such means, it requires a regulatory role such as that played by NOIP to make the achievement of this noble goal a reality. The establishment of NOIP is thus an important step in the quest for technological and industrial take-off by the country.

FEES CAPITALIZATION SHEET

| | 1979 | 1980 | 1981 | 1982 | 1983 |
|---|---|---|---|---|---|
| Discount Factor | 1.46 | 1.33 | 1.21 | 1.1 | 1.0 |
| Net Profit | 2.051,000 | 1,817,000 | 3,700,000 | 1,800,000 | 1,800,000 |
| Net Sales | 5,013,000 | 9,212,000 | 10,800,000 | 14,800,000 | 14,800,000 |
| ENPV Sales | 7,318,980,000 | 12,251,960 | 13,068,000 | 16,280,000 | 14,800,000 |
| NPV Profit | 2,994,460,000 | 2,416,610 | 4,477,000 | 1,980,000 | 1,800,000 |

ENPV Sales
63,718,940
ENPV Sales
ENPV Profit
13,668,070

1. PBT = $\frac{\text{ENPV Profit}}{55}$ = 24,851,036.36
2. 4% royalty = 24,851,036 x $\frac{4}{100}$ = 994,041.45 = R1
3. 2% on net turn-over = ENPV Sales x $\frac{2}{100}$ = 63,718,940 x $\frac{2}{100}$ = 1,274,378.80 = R2
4. TTF = $\frac{PBT}{R} = \frac{PBT}{R1+R_2}$ = $\frac{24,851,036.36}{2,268,420.25}$ = 10.96
5. LSEP = $\frac{1}{1+TTF} = \frac{1}{11.96}$ = 0.08
6. ERF = 1 - LSEP = 1 - 0.08 = .92

**ANNEX 4:** Guest lecture:
"Sources and Quality of Data for Demand Forecasting in Nigeria"
given by guest lecturer:
Mr. G. K. AJAYI, Chief Economist, Nigerian Industrial Development Bank Limited (NIDB)

# SOURCES AND QUALITY OF DATA FOR DEMAND FORECASTING IN NIGERIA

## I - INTRODUCTION

The evaluation of an industrial project consists of three broad aspects - technical, financial and economic. While these three areas do not fully exhaust all the issues involved in project analysis, they are the major ones in which the others are usually subsumed.

Technical appraisal considers the technical and engineering feasibility and soundness of the project concerning itself only with the availability, and supply at competitive prices, of all the physical facilities needed to make the project a reality. Such facilities include land, basic infrastructure, raw materials, machinery and equipment and technical skill. The primary focus of financial appraisal is on the financial viability of the project. It assesses the amount and sources of funds required to establish the project (balance sheet), relates costs to expected sales revenue to forecast profitability (profit and loss projections) and also examines the liquidity prospects of the project (cash flow analysis). As part of the financial appraisal exercise, market investigations have to be conducted to determine the marketing prospects of the project. Economic analysis evaluates the worthwhileness of the project from the viewpoint of the national economy particularly in relation to the basic economic and social objectives of the country as a whole.

My brief - highlighting the sources and quality of data for market evaluation - relates to a significant aspect of financial appraisal. As a matter of fact, demand forecasting represents the first step in the order of evaluation of any project. Before putting much effort into the appraisal of any project, an attempt must first be made to find out

whether its output can be sold. Much valuable time and effort must have been wasted if after completing all the other details of the appraisal, it is sadly discovered that the required market is either not there or is inadequate to accommodate even the minimum technical and economic scale of operation. Issues of marketability of product and output must, therefore, be resolved before embarking upon a comprehensive appraisal.

## II - STATISTICAL REQUIREMENTS FOR DEMAND FORECASTING IN NIGERIA

In an economy like Nigeria with a rather unstable investment climate, demand analysis can be very arduous and cumbersome. This is because for any such analysis to be meaningful and reliable, it must embrace a wide variety of quantitative data as well as a host of qualitative information. However, the first nut to crack is a proper identification of the product of the project as this will guide the analyst immensely in his quest for information. Demand patterns often vary with the nature of products.

Factors influencing the demand for consumer goods vary from those of intermediate and capital goods. Even within each group, there may be differences which are basic to demand projection. For example, consumer durables and non-durables have factors that are common as well as others that are peculiar to each group. A product that is light in relation to its value may enjoy a national market owing to its relatively low transportation cost whereas the one that is bulky in relation to its value or fragile may have a more limited, local, market because of high transportation costs. It is also necessary to know for which income group the product is primarily meant - low income, middle income or upper income; rural or urban population; public or private sector. The nature of the product will determine the requirements from the following main types of data:

i. Quantitative data

The most direct statistics for demand forecasting are the time series of physical quantities of local output and imports of the product. Exports would have featured but for the fact that Nigeria scarcely exports any manufacturing product. Similarly variations in the stock of the product are relevant but could not be included for lack of information. Consumption (C) which is a proxy for actual or effective demand can be equated thus

C = local output + imports - exports - stock increases

bearing in mind that in the Nigerian context, only the first two may be necessary or available to work with.

In the case of Nigeria with a local entrepreneurship characterised by high risk aversion and a high propensity to rush into areas where others have gone and succeeded, local production statistics must not be limited to only the past and present but also include potential production. For example, any demand forecasting in Nigeria for beer or soft drinks (where the number of projects undergoing implementation and at the active planning stage are as large as, if not larger than, the number of existing ones) which is at the moment based on historical and present output would result in a grossly misleading supply gap. Any investment decision based on such analysis may end up in disaster.

Another very essential numerical information is the one on the trend of prices for the product. Time series of prices for the product (for the period corresponding with that of physical production) are required. They should include ex-factory prices, wholesale prices, retail prices and (in the case of internationally traded products) free-on-board (fob) prices (for products meant for export) and cost - insurance - and - freight (cif) prices (for import-

substituting products). It should be noted that price statistics are much more difficult to obtain than production and import statistics.

Apart from production, import and price data, there may be need (depending on the nature of the product) to consider macro-economic data which also influence demand. These include national income, customs tariffs, excise duties, household budgets (rural or urban). Availability of such macro-economic data permits the use of more elaborate techniques of demand forecasting.

ii. Non-Quantitative Data

In a country like Nigeria with a rather unstable investment climate, demand estimation must go beyond the analysis of numerical data to include all the qualitative factors prevailing in the environment of the project. Depending on the direction of the swing of the national economic pendulum, the Government may prohibit or liberalise the importation of the product. Many projects were set up to produce building materials including ceramic sanitary wares in the country in response to large-scale import restrictions only to find the door widely opened to importation of building materials shortly after they began commercial operation. The reason for the import liberalisation was the need to facilitate the execution of the housing programme by the Civilian Administration. Many such projects were hard hit until the oil glut and the resultant austerity provided some relief. Demand analysis should, therefore, examine the legislative and administrative environment of the project and attempt to project likely trends in that respect.

Similarly, any physical or political barriers to the free flow of goods must be considered. With inadequate infrastructural facilities, it may be difficult for the

product to enjoy a market much wider than its locality even if it is a bulky product mainly consumed by the Government, such as crushed stones and sandcrete slabs and rings for road construction, the political leaning of the project owner in relation to the political party in power in the State or area must be considered. The line between politics and economics in Nigeria is often blurred. Despite a pressing economic need, a State Government may refuse to buy the products of a political opponent.

The distribution and marketing strategy of the project concerned must also be examined. For example, even during the days of a serious beer shortage in the country, there was an NIDB-assisted brewery which found it difficult to sell all its output on account of its distribution strategy. While the other breweries would deliver to their dealers and also collect empty bottles back, that brewery insisted on its dealers taking delivery at the factory and returning empty bottles on their own which most of its dealers found very inconvenient.

Qualitative information is vital to demand forecasting and should never be ignored. Despite the problem of quantification, it can be used to modify the quantitative results obtained from numerical forecasting. Just as at the present in Nigeria, demand forecasting in certain industrial subsectors (like textiles, shoes and electronics) which ignore the effect of smuggling would lead to a wrong investment decision.

## III - SOURCES AND QUALITY OF MARKET DATA IN NIGERIA

Like some other developing economies, Nigeria has a very weak statistical base. Almost all research activities are plagued by the limited quantity and quality of available statistics. It is virtually impossible for the market

analyst to obtain adequate statistics from existing published and unpublished sources. He invariably has to undertake some survey to supplement whatever he can get from his study of existing documents. We shall discuss these two approaches in turn.

A. Data from Existing Documents

The study of existing information or desk research, can tap data from a wide variety of sources as follows:

a. Official sources: Data on macro-economic information such as national income, imports, consumer price indices and industrial Production by sub-sectors can be obtained from the following official publications:

1. Nigeria Trade Summary, published by Federal Office of Statistics (FOS).
2. Annual Abstract of Statistics (FOS).
3. Digest of Statistics (FOS).
4. Economic Indicators (FOS).
5. Survey of Industrial Production Data (FOS).
6. Economic and Statistical Review (FOS).
7. Nigeria's Principal Economic and Financial Indicators (Central Bank of Nigeria, Research Department).
8. Review of External Trade (FOS).
9. Composite Price Indices (FOS).

Official information on prices are lacking but data on tariffs and excise duties can be obtained from the Board of Customs and Excise.

However, the use of data from official sources demands caution. The degree of reliability is usually low. Frequent changes in the rules of data collection make comparability of series meaningless. A consistent trend can hardly ever be determined from official data. A much more serious problem is the existence of a wide time lag sometimes reaching 4 or 5

years. No wonder the economic expert commissioned to write Nigeria's First National Development Plan, Stopler, wrote a book on his experience of statistical handicaps entitled Planning Without Facts. The main problem is that the Federal Office of Statistics has been given a legal monopoly in data collection such that no other body can venture into its area of jurisdiction. For example, the Research Department of the Central Bank of Nigeria used to provide very useful information on consumer prices until it was forced to stop by the Government.

b. Government Agencies: Useful market data can also be obtained from certain Government research agencies and development finance institutions. The Nigerian Institute of Social and Economic Research (NISER) has a Consultancy Division in Lagos which has undertaken a good number of useful studies. The Federal Institute of Industrial Research Oshodi (FIIRO) also has many valuable documents. So do the major development finance institutions (DFIs). The records of DFIs are indispensable when it comes to assessing potential production through the projects in their pipeline. The Industrial Division of the Central Bank Research Department also undertakes relevant studies which the demand analyst would find useful.

(3) International Agencies: Reference to the documents of international agencies could be highly rewarding. In this respect, the UN Yearbook of Industrial Statistics, the UNIDO Profiles of Manufacturing Establishments, the Industry Profiles of the United States Department of Commerce (to mention a few) are useful. So are the documents of the World Bank Resident Mission.

The major weakness of such data, however, is that data are often published as they are obtained from the Government with all the limitations of official statistics.

(4) Trade Associations: Such trade associations as the Nigerian Chamber of Commerce (particularly its Industrial Group) and the Manufacturers' Association of Nigeria have statistics that are superior to those in official documentation.

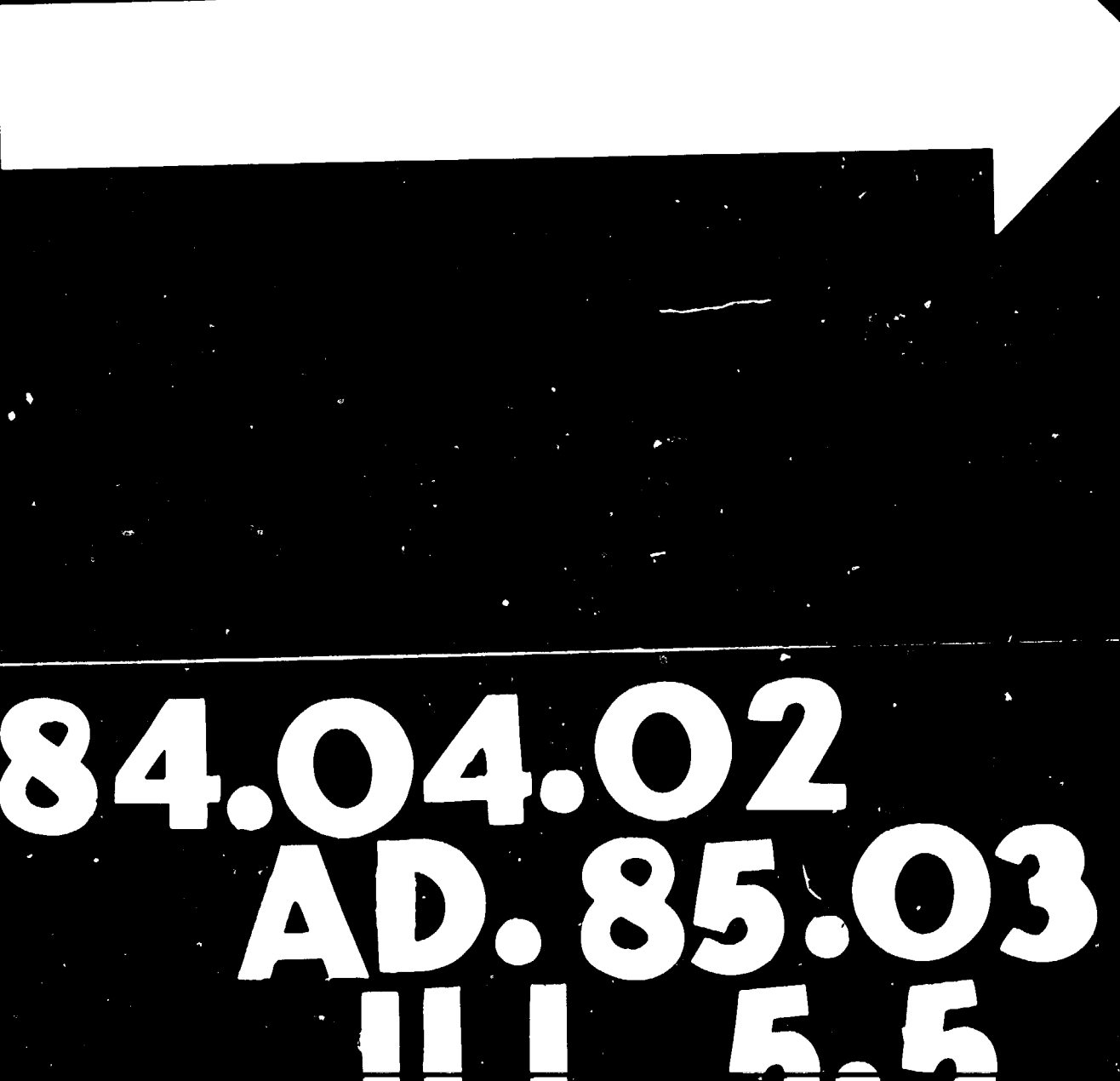
(5) Private Research Organisations and Consultants: Relevant documents in this area include ICON Merchant Bankers' INCH which gives details of a good number of manufacturing enterprises and the Industrial Profile of Nigeria prepared by Skoup (Consultants) for the Federal Ministry of Industries.

(6) Newspapers: Some weekly newspapers are of immense use to the demand analyst. They include the Business Concord, Business Times and Financial Punch. The London Financial Times also provides some useful price information.

B. Special Surveys

To supplement the information obtained from existing documents, the demand analyst may have to conduct a survey to obtain both quantitative and qualitative data. He may need to survey existing enterprises producing the product to obtain data on capacity, output, sales and prices and non-quantitative information on consumer feeling, marketing strategy and effect of the legislative and economic environment. Where the population of existing producers is too large for complete coverage, a sample has to be selected. The Industrial Directory of the Federal Ministry of Industries, the Manufacturers Association of Nigeria's Who Makes What in Nigeria, ICON's INCH mentioned above and Jikonzult Management Services Limited's Nigeria Company Handbook may all help in sample selection.

However, it should be noted that market surveys can be very costly. Moreover, its usefulness depends on such factors as the quality of the questionnaire or oral interview guide or the case may be, the experience of the investigator and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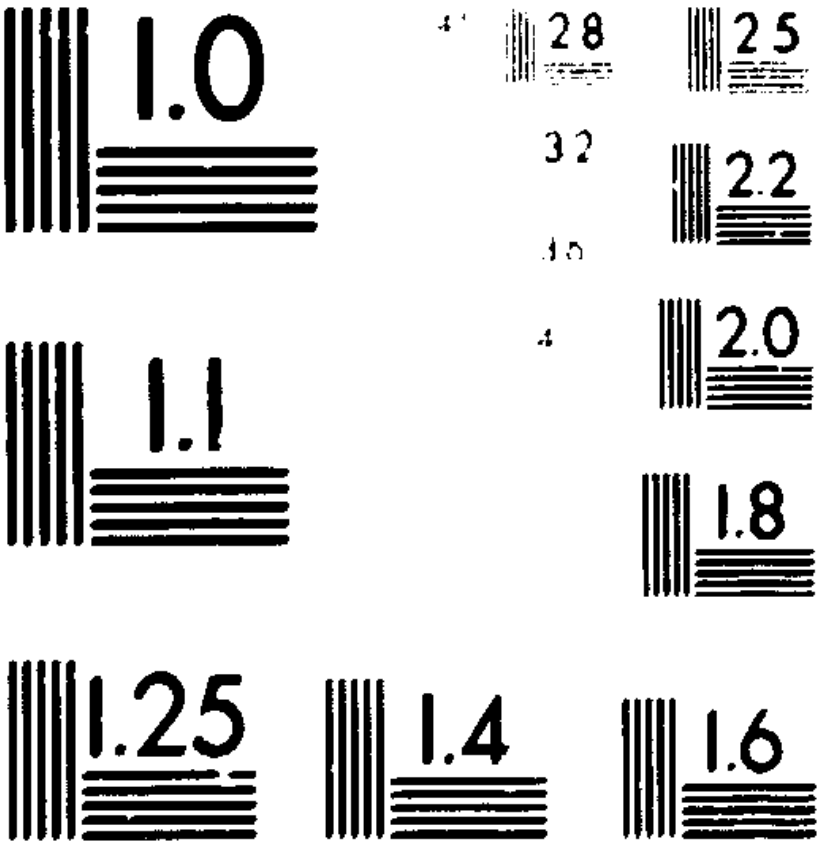

the respondent. It also depends on the randomness of the sample selected. Considering the high degree of non-response and false information, an initially random sample may result in information that is far from being representative and reliable. But surveys, by and large, yield statistics that are far more reliable than data deom existing documentation.

## CONCLUSION

In the light of Nigeria's weak statistical base, only simple techniques of demand forecasting can at the moment be used. The Research Department of NIDB usually makes use of simple regression techniques for trend fitting and extrapolation to determine the supply gap. Nigeria has not yet reached a stage where advanced econometric models can be employed for demand estimation. A recent attempt by my Department to forecast the demand for wheat flour by multiple regression ended in futility when the matrix determinant turned out to be zero owing to linear dependence among the variables involved.

G. K. Ajayi
NIDB Research Department
13th October, 1983

**ANNEX 5:** Test for UNIDO Training Course:
18 questions to be answered by the participants of the seminar

Test for UNIDO Training Course

Lagos, Nigeria - October 6, 1983

1. What is the difference between NPV and IRR, and indicate how you could estimate the IRR graphically? (Label all lines.)

2. Indicate the three types of debt repayment schemes used, and describe the difference between them?

3. What is a 'grace period' and when is it appropriate?

4. To calculate the Current Ratio, what 'entries' must you use?

5. What cost factors are considered in calculating 'working capital'? Give an example of how it might be done.

6. What 'costs' are included in the UNIDO definition of: Production Cost ? Factory Cost ? Operating Cost ?

7. What do you need to know about costs to construct a 'break-even' chart ? Construct one, and label all lines.

8. What kind of information do you need to know in order to prepare a manpower requirements table and the Estimate of production costs

9. What is meant by 'project life' and 'plant life' and how may they differ ? Where is each approriate to be used ?

10. Describe 'inventory costing' by LIFO and FIFO methods ? Which one would:maximize the annual profit ? overstate inventory ?

11. What does it mean that 'inventory turnover' is 7 times ? How was this calculated ?

12. What does it mean if 'collections' are running 90 days ? How was this calculated ?

13. What kind of information would you need to know to determine if a prospective project had a market ? How would you treat the data (Methods of statistical analysis)

14. How would you handle the costs for land - if they are a lump sum ? - if they are an annual rental ? How would you depreciate them ?

15. Describe how the normal demand ('optimal allocation') is influenced by subsidies ? Indicate this effect graphically.

16. Describe the mechanism of demand/supply of foreign exchange works to 'self-regulate' in an economy with no artificial trade or monetary barriers ?

17. What is the 'shaddow wage rate' in the 'Little-Mirrlees' Method, what are its components, and how is it calculated ?

18. A loan of Naira 1 million at 14% for 15 years, 3 years 'grace' is given to a project. Calculate annual payment by 'annuity' method ? What is the interest payment in the first and last years of the loan? (Note: Drawdowns: 1st yr=N250,000; 2nd yr=N500,000; 3rd yr=N250,000.

10.57.4

**ANNEX 6:** Teaching Materials and Outlines for Slides, Module I: Outline of the Project Development Cycle

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept – 14 Oct 1983
Materials used by
Mark Weber

# T E A C H I N G
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COURSE OUTLINE:
THE PROJECT CYCLE

Refer Section: I
Module: I

# INDUSTRIAL PROJECT PREPARATION FINANCIAL AND COST-BENEFIT AND TECHNICAL ANALYSIS/EVALUATION

## COURSE ORIENTATION

WHAT IS PROJECT PREPARATION AND PLANNING ?

- WHAT TO PRODUCE ?
- HOW TO PRODUCE IT ?
- HOW MUCH TO PRODUCE ?
- WHERE TO PRODUCE IT ?
- HOW TO DISTRIBUTE AND SELL THE PRODUCTION ?
- HOW TO FINANCE ?
- HOW TO MANAGE THE PROJECT ?

ALTERNATIVES TO BE EXAMINED FOR DECISIONS :

- MARKET SEGMENT
- TECHNOLOGY
- SIZE OF FACILITY
- LOCATION/ SITE
- MARKETING IMPLEMENTATION PROGRAM
- METHODS OF FINANCING
- ORGANIZATIONAL STRUCTURE

ADDITIONAL FACTORS :

- RAW MATERIAL AVAILABILITY
- ECONOMICS OF CAPITAL ALLOCATION
- DEVELOPMENT PRIORITIES
- SOCIAL BENEFITS FROM BOTH PRODUCTION AND THE PRODUCTION PROCESS

## COURSE ORIENTATION (2)

OBJECTIVES :

WHAT IS A 'FEASIBILITY STUDY' ?

WHY ARE FEASIBILITY STUDIES MADE ?

WHEN AND WHAT KIND OF STUDIES SHOULD BE UNDERTAKEN ?

THE PHASES OF AN INDUSTRIAL DEVELOPMENT PROJECT :

PRE-INVESTMENT PHASE

PROJECT IDENTIFICATION - 'PROFILES'

PROJECT 'OPPORTUNITY' STUDIES.

BY : AREA or REGION

SUBSECTOR of the ECONOMY

RESOURCES AVAILABLE

INTERLINKAGES WITH OTHER PROJECTS

SPECIFIC PROJECT INVESTMENT STUDIES

ALTERNATIVE METHODS & TECHNOLOGIES

COST IDENTIFICATION & LIMITATIONS

SPECIFICATION OF CONSTRAINTS

PRE-FEASIBILITY STUDIES :

INTERMEDIATE STAGE - LESS FULLY DEVELOPED THAN 'FEASIBILITY' STUDY

LESS COSTLY

PRE-SELECTION PROCESS/ALLOCATION OF RESOURCES

TRANSFORMATION INTO AN INVESTMENT PROPOSAL

# COURSE ORIENTATION (3)

THE PHASES OF AN INDUSTRIAL DEVELOPMENT PROJECT :

SUPPORT STUDIES :

MARKET RESEARCH AND ANALYSIS :

RAW MATERIAL AND INPUT STUDIES :
- PRICES/PRICE TRENDS (Economic)
- LABORATORY STUDIES/TESTS (Technical)

LOCATION STUDIES :
- UTILITY AVAILABILITY (WATER, ELECTRICITY)
- TRANSPORT COSTS
- ORIENTATION TOWARDS RAW MATERIAL or MARKETS
- AVAILABILITY OF MANPOWER

TECHNICAL STUDIES / ECONOMIES OF SCALE
- ALTERNATIVE PROCESSES/PLANT SIZES
- PILOT PLANT OPERATION TO PROVE THE TECHNOLOGY

EQUIPMENT STUDIES :
- EQUIPMENT - IDENTIFICATION OF POTENTIAL SUPPLIERS
- CHOICES ON DEGREE OF MECHANIZATION or INTENSIFICATION OF MANUAL OPERATIONS
- SPECIFICATIONS FOR SUCCESSFUL BIDDING

THESE ARE UNDERTAKEN TO SUPPORT THE 'PRE-FEASIBILITY' OR 'FEASIBILITY' STUDY

THEY MAY BE EXPANDED TO CLEAR-UP QUESTIONS

IN RELATION TO THE COMPLEXITY OF A 'FEASIBILITY STUDY'

THEY ARE :

- SINGLE SUBJECT FOCUSED
- MAY INVOLVE VERY SPECIALIZED SKILLS
- ASSIST IN THE PROJECT SELECTION PROCESS

THE FEASIBILITY STUDY :

MUST PROVIDE ALL THE INFORMATION -
- TECHNICAL SPECIFICATIONS
- COMMERCIAL/MARKET
- FINANCIAL/VIABILITY/ABILITY TO GET CREDITS
- ECONOMIC/COST-BENEFIT in terms of COLLECTIVITY

MUST INDICATE POSSIBLE ALTERNATIVES

MUST DEFINE PROJECT SCOPE/SIZE etc.

SHOULD CONTAIN DRAWINGS, TABLES etc.

## COURSE ORIENTATION (4)

THE PHASES OF AN INDUSTRIAL DEVELOPMENT PROJECT :

THE FEASIBILITY STUDY (continued)

COMBINES RESULTS OF :

- MARKET RESEARCH
- RAW MATERIAL INPUTS
- LOCATION
- TECHNICAL
- EQUIPMENT .....STUDIES

LEADS TO A DEFINITIVE INVESTMENT DECISION

EVALUATION AND DECISION STAGES :

EVALUATION REPORT

- TECHNICAL EVALUATION
- FINANCIAL EVALUATION - Commercial Profitability
- ECONOMIC EVALUATION - Cost/Benefit Analysis - National Economic Profitability

FIVE PARAMETERS :

- Aggregate Consumption
- Income Distribution
- Growth Rates of National Income
- Employment Objectives
- Self-Reliance and Merit Wants

INVESTMENT STAGE :

NEGOTIATION and CONTRACTING

FINAL PROJECT DESIGN

CONSTRUCTION

START-UP and COMMISSIONING

OPERATIONAL PHASE :

EX-POST EVALUATION STAGE :

IMPORTANCE IN CASES OF PROJECT PROBLEMS

CERTAINLY IN CASES OF PROJECT FAILURES

NECESSARY IN CASES OF PROJECT ORIENTATION CHANGES FOR POLITICAL or OTHER REASONS

## COURSE ORIENTATION (5)

THE PHASES OF AN INDUSTRIAL DEVELOPMENT PROJECT :

THE PROJECT CHOICE :

THE OPPORTUNITY STUDY :

THE CONCEPT OF ECONOMIC ADVANTAGE IN TRADE AND DEVELOPMENT

PRIORITIZING THE PROJECT SELECTION :

PRESENT CONSUMPTION PATTERNS and 'IMPORT SUBSTITUTION'

RAW MATERIAL PROCESSING and 'ECONOMIC INTEGRATION'

EXPORT PROMOTION and REGIONAL ECONOMIC INTERDEPENDENCE

THE FIVE COST/BENEFIT PARAMETERS

'MERIT WANTS' AND POLITICAL DETERMINATION

ECONOMIC CRITERIA :

AVAILABILITY OF MARKETS

AVAILABILITY OF RAW MATERIALS

AVAILABILITY OF 'APPROPRIATE' TECHNOLOGY

AVAILABILITY OF MANPOWER AND SKILLS
PROJECT IMPLEMENTATION CAPABILITY
TRAINING POSSIBILITIES AND FACILITIES
TECHNOLOGY TRANSFER AND DEVELOPMENT

AVAILABILITY OF NECESSARY INFRASTRUCTURE
WATER, POWER, FUELS

AVAILABILITY OF CAPITAL or CREDITS

POLICY OBJECTIVES :

ALLOCATION OF CAPITAL AS A 'SCARCE'

SELF-SUFFICIENCY WITH REGARD TO BASIC NEEDS

INDUSTRIALIZATION

PROCESSING INTEGRATION AND LINKAGES

REGIONAL TRADE DEVELOPMENT

FOREIGN EXCHANGE GENERATION OR SAVINGS

INDEPENDENCE FROM EXTERNALLY CAUSED CYCLICALITIES

PRODUCT DIVERSIFICATION and MARKET DEVELOPMENT

TAKE ADVANTAGE OF ECONOMIES OF SCALE

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept – 14 Oct 1983
Materials used by
Mark Weber

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NATIONAL, SECTORAL
and PROJECT PLA' 'ING

Refer Section: 3
Module: I

** NIGERIA **

THE NATIONAL PRIORITIES : ALLOCATION OF RESSOURCES

I. IMPROVE STANDARD OF LIVING OF POPULACE (Cost-Benefit Analysis--AGGREGATE CONSUMPTION OBJECTIVE)

II. DEVELOPMENT OF :

AGRICULTURE

INDUSTRY

IMPORT SUBSTITUION

EXPORT GENERATION

III. EMPLOYMENT GENERATION

IV. PROVISION OF SOCIAL SERVICES ('Merit Wants')

FOCUS OF THE COURSE : INDUSTRIAL SUB-SECTOR

A. MAXIMUM UTILIZATION OF AGRICULTURAL AND MINERAL RESOURCES

B. MAXIMIZE 'VALUE ADDED' THROUGH :

AVAILABILITY OF MARKETS FOR PRODUCTS

AVAILABILITY OF RAW MATERIAL INPUTS

DEVELOP SKILLS IN SECURING APPROPRIATE TECHNOLOGY

AVAILABILITY OF MANPOWER AND SKILLS TRAINING

ACCESS TO CAPITAL FOR INVESTMENT

-- INCLUDING METHODS OF FOREIGN FINANCING

PROCUREMENT OF NECESSARY INPUTS ON ADVANTAGEOUS TERMS

THESE GOALS WERE ENUMERATED BY THE HONORABLE MINISTER OF INDUSTRIES IN HIS OPENING ADDRESS

Lagos, 5 September 1983

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept – 14 Oct 1983
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INDUSTRIAL POLICIES
and STRATEGIES

Refer Section: 6
Module: I

# PROJECT IDENTIFICATION (2)

## POLICY INSTRUMENTS :

PROMOTION OF :

| | |
|---|---|
| IMPORT SUBSTITUTION : | TARIFFS<br>QUOTAS<br>LICENSING<br>ARTIFICIAL EXCHANGE RATES |
| EXPORT PROMOTION : | SUBSIDIES<br>TAX EXEMPTIONS/DRAWBACKS<br>EXCHANGE RATE ADVANTAGES |
| EMPLOYMENT : | WAGE LEVELS<br>TAX EXEMPTIONS<br>FRINGE BENEFIT FORGIVENESS<br>TRADE UNION PRESSURES |
| LOCATION : | LOCAL TAX DIFFERENTIATION<br>CHANGES IN INVESTMENT INCENTIVE PACKAGES<br>PUBLIC INVESTMENT IN NEEDED INFRASTRUCTURE<br>LAND AVAILABILITY AND PRICES |
| CAPITAL ACCUMULATION AND PRIVATE SAVINGS : | TAXES ON CONSUMPTION;<br>SALES TAXES<br>TURN-OVER TAXES<br>INCOME TAXES AND SPECIAL EXEMPTIONS |
| GENERAL INVESTMENT INCENTIVES : | CREDIT FACILITIES<br>SUBSIDIZED INTEREST RATES<br>CAPITAL REPATRIATION AGREEMENTS<br>TAX HOLIDAYS<br>EXEMPTIONS FROM LOCAL OWNERSHIP REQUIREMENTS<br>ACCELERATED WRITE-OFFS<br>DIVIDEND REPATRIATION ALLOWANCES |
| GENERAL INVESTMENT DISINCENTIVES : | HIGH INFLATION RATES<br>REVALUATIONS AND 'FREEZING' OF ASSETS AND DEPOSITS<br>UNCONVERTIBILITY OF CAPITAL AND DIVIDEND REPATRIATION<br>UNREALISTIC LOCAL OWNERSHIP REQUIREMENTS IN FACE OF LOCAL CAPITAL AVAILS<br>HIGH RATES OF INTEREST WHICH REFLECT RISK ASSESSMENT<br>PRICE CONTROLS |

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept - 14 Oct 1983
Materials used by
Mark Weber

# T E A C H I N G
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# O U T L I N E S
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# S L I D E S

PROJECT IDENTIFICATION :

Refer Section: 7
Module: I

# PROJECT IDENTIFICATION

APPROACH IN ONE OF TWO WAYS :

I. 'T O P  D O W N'

PROJECTS DERIVED FROM COUNTRIES POLICIES AND STRATEGIES :

RESULT :

PROJECTS ARE COMPATIBLE WITH THE LONG-TERM PLANS

PROJECTS MAY HAVE MICRO*ECONOMIC DEFICIENCIES

II. 'B O T T O M  D O W N'

PROJECTS DERIVED FROM 'GRASS ROOTS'
IE: MICRO*ECONOMIC CONSIDERATIONS
'THE MARKET ECONOMY' APPROACH

RESULT :

PROJECTS USUALLY FINANCIALLY AND COMMERCIALLY SOUND
PROJECTS MAY DIFFER FROM POLICIES AND STRATEGIES OF THE GOVERNMENT
PROJECTS MAY FAIL COST-BENEFIT TESTS OF ECONOMIC AND SOCIAL VALUE CONTRIBUTION DEPENDENT UPON STRESS GIVEN TO CRITERIA

QUESTION ?? IS THE'FREE MARKET' APPROACH INCOHERANT WITH PROGRAMS FOR DEVELOPMENT ?

WHAT ARE THE OBSERVED RESULTS IN THE CENTRALLY PLANNED ECONOMIES ? WHAT SHOULD NIGERIA DO ?

**ANNEX 7:** Teaching Materials and Outlines for Slides, Module II: Market Analysis

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept - 14 Oct 1983

Materials used by
Mark Weber

# T E A C H I N G
# M A T E R I A L S
# A N D
# O U T L I N E S
# F O R
# S L I D E S

MARKET RESEARCH

Refer Section: 3
Module: II

# MARKET RESEARCH

## Orientation

IDENTIFY the PRODUCT - (Specifications)

" " QUANTITY - Domestic Demand
- Potential for Export

" " PRICE - Supply/Demand Relationship
'Elasticity'

" " MARKET - Charateristics of Consummer Methods of Consumption
- Character and Restraints of Distribution Channels

HOW MARKET RESEARCH IS CARRIED OUT :

ANALYSIS - Past and Present DEMAND Data

'Purifying' the DEMAND TREND by.

Fragmenting/Segmenting MARKET

Separating EFFECTS of PRICE CHANGES

(Note: CONSUMPTION is Not Always Equal to DEMAND. Why?)

DATA REQUIREMENTS:

WHAT is needed?

WHERE can it be found?

STATISTICS: DOMESTIC MARKET : AREA SERVED etc.

LOCAL PRODUCTION PLUS IMPORTS

'SMUGGLING'/MARKET DIFFERENTIATION

LIMITATIONS of DATA GROUPINGS/BREAKDOWN

SEARCH for RELATED DEMANDS WHICH ARE KNOWN or CAN BE INDEPENDENTLY ESTIMATED

PRICE DATA: IMPORTS - F.O.B. / C.I.F. (Free on Board; Cost Insurance & Freight)

PRICE STRUCTURE: Breakdown; ex-factory, Middle-men commissions, retail mark-up

DISTRIBUTION REQUIREMENTS: Stocks, freight containers, packaging, returns, product warrenties and guarantees, (aging, etc.)

OTHER DATA SOURCES:

FAMILY BUDGET SURVERYS/'MARKET BASKET'
IMPORT DUTIES/SALES TAX COLLECTIONS

QUALITATIVE DATA:

CONSUMER ATTITUDES
DEGREE of COMPETITION in MARKET
GOVERNMENT REGULATIONS: HEALTH LICENSING; SUBSIDIES etc.

# MARKET RESEARCH

## Orientation (2)

How MARKET RESEARCH IS CARRIED OUT :

STATISTICS: EXPORT MARKET : AREA SERVED etc.

IMPORT STATISTICS IN PROSPECTIVE MARKETS/ AVAILABILITY

IMPORTANCE OF FREIGHT

POSSIBILITIES OF TRANSPORT AND ECONOMICS

GOVERNMENT REGULATIONS AND LICENSING/ QUOTAS/
IMPORT DUTIES/ EXPORT 'DRAWBACK on TAXES ??
OTHER INCENTIVES TO ENCOURAGE EXPORTS

DEGREE OF COMPETTION IN PROSPECTIVE MARKETS : TRADITIONAL TRADING PARTNERS : CAPTIVE SUBSIDIARIES etc.

METHODS OF DISTRIBUTION/ AGENTS; FEES; PROMOTION METHODS

FINANCING OF STOCKS; PROBLEMS OF WARRANTIES & GUARANTEES
PRODUCT RETURNS etc.

PRICE DATA; F.O.B./ C.I.F.

PRICE STUCTURE: Breakdown; costs of transport; mark-ups

DISTRIBUTION REQUIREMENTS: containers, packaging, quantities
quality determinants, etc.

SOURCES OF INFORMATION :

PUBLISHED DATA : Actual, ESTIMATES

OFFICIAL: GOVERNMENT; BANKS; TRADE ORGANIZATIONS

UNPUBLISHED DATA : PRESENT IMPORTERS
PRIVATE ENTREPRENEURS/POTENTIAL PARTNERS
SURVEYS; INTERVIEWS etc.

EXAMPLES:

DOMESTIC MARKET :

MINISTRIES; CENTRAL BANK ANNUAL REPORTS
CUSTOMS DATA; TRADE PROMOTION AGENCIES
FIVE YEAR PLAN; GOVERNMENTAL BUDGETS

EXPORT MARKET :

INTERNATIONAL ORGANIZATIONS :

I.M.F.
WORLD BANK
UNCTAD/ ITC
UNIDO
FAO / ILO
O.E.C.D.
E.C.A. (Ecomomic Commission for Africa
B.A.D. (African Development Bank)
ECOWAS Secretariat
International Federations and
Associations
Equipment Suppliers

# MARKET RESEARCH
## Orientation (3)

DEMAND FORECASTING :

- UNCERTAINTY
- POTENTIAL INFLUENCE OF UNFORSEEN EVENTS

USE OF MATHMATICAL TECHNIQUES :

- TIME SERIES
- FITTING A TREND LINE
  - REGRESSION; CORRELATION OF DATA
  - TYPES OF TRENDS : STRAIGHT LINE
    COMPOUNDING/ EXPONENTIAL
    SEASONAL
    CYCLICAL
  - USES OF WEIGHTED AND MOVING AVERAGES etc.
- DATA FROM 'INPUT-OUTPUT' MODELS
- USE OF ECONOMETRIC MODELS
- STATISTICAL SAMPLING TECHNIQUES

USE OF JUDGEMENT :

- COMMON SENSE

COMPARISONS OF RESULTS UNDER DIFFERENT METHODS :

- FAMILY BUDGET SURVEYS ; DISPOSABLE INCOME ESTIMATES
- INTERNATIONAL COMPARISONS USING PUBLISHED DATA FOR OTHER MARKETS
- PRODUCT SUBSTITUTION IN OTHER MARKETS
- EFFECTIVENESS OF IMPORT SUBSTITUTION IN OTHER MARKETS
- COMPARABLE CASES OF EXPORT PROMOTION AND RESULTS ACHIEVED
- CHECKING OUT THROUGH USE OF CAREFULLY DESIGNED SAMPLING

WHERE TO SEEK ASSISTANCE :

- 'WHEN' IS AN INDIVIDUAL DETERMINATION
- USE OF CONSULTANTS; INDUSTRIAL ENGINEERING AND OTHERS
- POSSIBILITY OF 'REPROCESSING' ORIGINAL DATA (ex. CUSTOMS DATA) TO FIND REQUIRED INFORMATION USING ORIGINAL DOCUMENTS
- USE OF THE POTENTIAL MACHINERY SUPPLIER
- USE OF THE APPROPRIATE INDUSTRY TRADE ORGANIZATION

# MARKET RESEARCH
## Orientation (4)

OBJECTIVES :

DETERMINE :

PRODUCT SPECIFICATION

MANUFACTURING QUANTITY

SALES PRICE

MARKET LIMITATIONS :

TYPE OF DOMESTIC DEMAND/ CONSUMER PREFERENCES

PRODUCTION LIMITATIONS & FORECAST DEMAND

POTENTIAL TO EXPORT

DISTRIBUTION AND PRICE STRUCTURE/
PRICE CONTROLS

CATEGORY OF MARKET :

CONSUMER GOOD // DURABLE; NON-DURABLE

INDUSTRIAL GOOD
LINKAGES WITH OTHER PRODUCT PRODUCTION

DEMAND FACTORS :

IDENTIFICATION OF TRENDS

PRODUCT SUBSTITUTION

MARKET RESEARCH TECHNIQUES (Vocabulary)

MARKET SECTORS/SEGMENTS = FRACTURIZATION

RESUPPLY OF MARKET DEMAND :

PRODUCT LIFE CYCLE

PLANNED OBSOLESCENCE

COLLECTION OF DATA :

CORRELATION WITH 'KNOWN' TRENDS

DEMAND INTER-RELATIONSHIPS

AVAILABLE STATISTICS

ESTIMATION OF FUTURE DEMAND :

NOT A SCIENCE; MORE OF AN ART

INFLUENCE OF EVENTS - PLANNED and UNPLANNED

SENSITIVITY TO WHAT FACTORS

INFLUENCE OF PRODUCT SPECIFICATIONS :

QUALITY VERSUS PRICE OBJECTIVES

DISTRIBUTION LIMITATIONS AND RESTRAINTS

DEMAND CREATION/SUBSTITUTION
ADVERTISING etc.
OTHER POSSIBILITIES

IS IT NECESSARY TO USE A CONSULTANT ? ?

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept - 14 Oct 1983
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# T E A C H I N G
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[illegible] REQUIREMENTS/TYPE etc.

Refer Section: A
Module: II

# MARKET RESEARCH
## Discussion

DEMAND and MARKETING ANALYSIS

A. MANUFACTURER'S CRITERIA TO PRODUCE A PRODUCT

B. - MARKET ASSESSMENT

1. PRODUCT CLASSIFICATION : Consumer
   (by Market destination) Industrial
2. PRODUCT SPECIFICATIONS and CHARACTERISTICS

- MARKET SUPPLY

1. Present - Production
   Imports
   Substitutes
2. Future

- MARKET DEMAND

1. Is present SUPPLY equal to DEMAND ?
2. If not, what are restraining factors ?
   Will they continue to affect new project ?

- PRICE LEVELS and TRENDS

1. Factors influencing price levels:
   Quotas, Import duties, (ie; Tariff Bariers)

- CHANNELS of DISTRIBUTION
- GOVERNMENT POLICIES

C. SALES FORECASTING METHODS

* This is the objective of the exercise (Ref; Manual)

D. * ESTMATED SALES REVENUES

- VOLUME DETERMINANTS / PRODUCTION PROGRAM CAPABILITY
- PRICE OBJECTIVES:

1. MAXIMIZE ROI
2. MAXIMIZE PENETRATION of MARKET/INCREASE MARKET SHARE
3. STABILIZE MARKET; DEVELOPMENT OF LOCAL MATERIALS

- COST of SALES

1. METHODS of MARKET PROMOTION
2. ALTERNATIVES IN CHANNELS OF DISTRIBUTION
   - Determined by: MARKET CHARACTERISTICS
     - PRODUCT (perishable, durable, size etc.
     - CUSTOMER PREFERENCES and RESTRAINTS
     - DISTRIBUTION CHANNELS and RESTRICTIONS

Mktg & Fin. Analysis
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# T E A C H I N G
# M A T E R I A L S
# A N D
# O U T L I N E S
# F O R
# S L I D E S

MARKET RESEARCH
DATA SOURCES :

Refer Section: 4A
Module: II

LISTING OF DATA SOURCES

TITLES, ORGANIZATIONS & ADDRESSES

BRONNSTONE DM

Where to find business information

New York, John Wiley, 1979. xi, 616 p.

605 Third Avenue, New York, NY 10016, USA

ECONOMIST INTELLIGENCE UNIT, LONDON
Publication list
London.

Spencer House, 27 St. James's Place, London SW1A 1NT, UK.

UK British Overseas Trade Board
INTERNATIONAL DIRECTORY OF PUBLISHED MARKET RESEARCH.
London.

50 Ludgate Hill, London EC4M 7HU, UK

TROPICAL PRODUCTS INSTITUTE
Publications list.
London.

56/62 Gray's Inn Road, London WC1X 8LU, UK.

UN. DAG HAMMARSKJOLD LIBRARY
UNDOC. current index.
New York.

UN Publications, A-3315, UN, New York, NY 10017, USA.

UNIDO
Documents List
Vienna.

P. O. Box 300, A-1400 Vienna, Austria.

UNIDO
Industrial development abstracts.
New York, UN.

Sales Section, Palais des Nations, 1211 Geneva 10, Switzerland or UN Publications A-3315, New York, NY 10017, USA.

OECD
OECD publications.
Paris.

2 rue Andre-Pascal, 75775 Paris Cedex 16, France.

Chamber of Commerce of the United States
IMPORTER'S GUIDELINES; SOURCES OF INFORMATION FOR U.S.
Washington D.C.

224 Seventh St., Garden City, N.Y. 11530, USA.

* IMPORTERS AND FOREIGN EXPORTERS TO THE UNITED STATES.

Economic Information Service, the Hague
ECONOMIC TITLES
The Hague, Nijhoff.

P. O. Box 269, The Hague, Netherlands.

INTERNATIONAL CHAMBER OF COMMERCE
Publications.
Paris.

33 Cours Albert 1er, 75008 Paris, France

TRADE DIRECTORIES OF THE WORLD
Queens Village, Corner Publications.
211-03 Jamaica Avenue, Queens Village, NY 11428, USA.

ULRICH'S INTERNATIONAL PERIODICALS DIRECTORY
New York, Bowker.

1180 Avenue of the Americas, New York, NY 10036, USA.

INTERNATIONAL TRADE CENTRE
Annotated bibliography of country serials
Geneva.

Palais des Nations, 1211 Geneva 10, Switzerland.

UNCTAD
Guide to publications.
Geneva.

UNCTAD Information Service, Palais des-Nations, 1211 Geneva 10, Switzerland.

WORLD BANK, WASHINGTON
Catalog World Bank publications.
Washington, D.C.

1818 H. Street, N.W., Ashington, D.C. 20433, USA.

UN. ECONOMIC COMMISSION FOR AFRICA
List of ECA documents issued
Addis Ababa.

P. O. Box 3001, Addis Ababa Ethiopia.

GOVERNMENT PERIODICALS AND SUBSCRIPTION-SERVICES: PRICE
LIST 36
Washington, D.C.

US. Government Printing Office, Washington, D.C. 20402, USA.

...../2..

US. DEPARTMENT OF AGRICULTURE
List of available publications.
Washington, DC. (Its List no.-11)

Washington, D.C 20250q USA

US INTERNATIONAL TRADE COMMISSION
Publications.
Washington, D.C.

Washington, D.C. 20436, USA.

UN.ECONOMIC COMMISSION FOR LATIN AMERICA:
List of printed publications in English.
Santiago.

Casilla 1790, Santiago, Chile

PUBLISHED DATA ON EUROPEAN INDUSTRIAL MARKETS.
London Industrial Aids Ltd.

14 Buckingham Palace Road, London SW1W OQP, UK.

European Communities
EUROPEAN COMMUNITY AS PUBLISHER;
EXTRACT FROM OUR CATALOG OF PUBLICATIONS.
Brussels.

Case postale 1003, Luxembourg.

GOVERNMENT PUBLICATIONS.
London, Her Majesty's Stationery Office.

P. O. Box 569, London SE1 9NH, UK.

OECD
Macrothesaurus for information processing in the field of economic and social development.
Paris, 1978, xiii, 438 p.

2 rue Andre-Pascal, 75775 Paris Cedex 16, France.

UN STATISTICAL OFFICE
Standard international trade classification revision 2.
New York. 1975. viii, 117 p. (Statistical papers, Series M no. 34/Rev.2)
ST/ESA/STAT/SER.M/34/Rev.2.

UN Publications, A-3315, UN, New York, NY 100017, USA.
Sales Section, Palais des Nations, 1211 Geneva, Switzerland.

DICTIONARY OF ECONOMICS AND COMMERCE.
London, Pan Books, 1976. 437 p.

Cavaye Place, London SW10 9PG, UK.

HORTEN HE
Export-import correspondence in four languages. Correspondence commercial
Epping, Essex, CM16 4HL, UK.

Government Budgeting and Expenditure Controls: (Theory and Practice)
Publications Unit, International Monetary, Fund.
Box A-103, Washington DC 20431 USA.

US DEPARTMENT OF COMMERCE
United States Department of commerce publications - a catalog and index.
Washington, D.C.

Superintendent of Documents, US Government Printing Office, Washington, D.C. 20402, USA.

U.N. GENERAL SECRETARIAT
Catalog of publications.
Washington, D.C.

Washington D.C. 20006, USA.

HARVEY JM
Statistics Europe; sources for social, economic and market Research. 3rd ed.
Beckenham, CBD Research, 1976, xii, 467 p.

154 High Street, Beckenham, BR3 1EA, UK.

UN ECONOMIC COMMISSION FOR EUROPE
List of ECE documents.
Geneva.

ECE Documents Distribution, Palais des Nations, 1211 Geneva 10, Switzerland.

CURRENT BRITISH DIRECTORIES.
Beckenham, CBD Research.

154 High Street, Beckenham, BR3 1EA, UK.

UK. MINISTRY OF AGRICULTURE FISHERIES AND FOOD
MAFF publications catalogue. Pinner.

Tolcarne Drive, Pinner, Middlesex HA5 2DT, UK.

Customs Co-operation Council, Brussels
NOMENCLATURE FOR THE CLASSIFICATION OF GOODS IN CUSTOMS TARIFFS.
NOMENCLATURE POUR LA CLASSIFICATION DES MARCHANDISES DANS LES TARIFS DOUANIERS.
Brussels.

26-28 rue de l'Idustrie, B-1040 Brussels, Belgium.

TRADY GS
Materials handbook - an encyclopedia for purchasing agents, engineers, executives, and foremen.
10th ed.
New York, McGraw-Hill, 1971. viii, 1015 p.

1221 Avenue of the Americas, New York, NY 100020, USA.

HANSON JL
Dictionary of economics and commerce.
London, Macdonald and Evans, 1976, 412 p.

Estover, Plymouth PL6 7PZ, UK

FINANCE DEVELOPMENT (A quarterly )

World Bank Publications, P. O. Box 37523 Washington DC 37523 USA.

IMF glossary; English-French-Spanish.
Washington, 1979. VII, 155 p.

Washington, D.C. 20431, USA.

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PENGUIN DICTIONARY OF ECONOMICS.
London, Allen Lane, 1970. 467 p.

Allen Lane, 17 Grosvenor, London SW1, UK.

PETER'S ALMANAC YEAR BOOK
Croydon, Thomas Skinner Directories

Windsor Court, East Grinstead House, East Ginstead, West Sussex RH19 1XH, UK.

PRINCIPAL INTERNATIONAL BUSINESSES; THE WORLD MARKETING DIRECTORY.
New York, Dun and Bradstreet.

P. O. Box 3221, Church Street Station, New York, N.Y. 10008, USA.

WORLD WIDE CHAMBER OF COMMERCE DIRECTORY
Loveland, Johnson.
Box 455, Loveland, Colorado 80537, USA.

ACP STATES YEARBOOK. ANNUAIRE DES ETATS ACP : Brussels, Editions Delta.

92-94 Square E. Plasky, B-1040 Brussels, Belgium.

ECONOMIC YEARBOOK OF MEMBER STATES OF THE ORGANIZATION OF AFRICAN UNITY.
Terni, EDICA.

B. P. 146, 05100 Terni, Italy.

LESHER, RV
How to write a report your boss will read and remember.
Homewood, Ill., New Jones-Irwin, 1971. ix, 216 p.

1818 Ridge Road, Homewood, Ill. 60430, USA.

OWEN'S COMMERCE AND TRAVEL AND INTERNATIONAL REGISTER.
London, Owen's Commerce and travel Ltd.

100 Pelsize Lane, London NW3 3HB, UK.

WORLD IN FIGURES
London, Economist Newspaper.

25 St. James's Street, London SW1A 1HG, UK.

Union of International Associations
YEARBOOK OF INTERNATIONAL ORGANIZATIONS.
Brussels.

1 Rue aux Laines, 1000 Brussels, Belgium.

Association of Africa Trade Promotion organizations(AATPO).
DIRECTORY OF TRADE PROMOTION INSTITUTIONS IN AFRICA.
Tangiers.

P. O. Box 23, Tangiers, Morocco.

AMERICAN EXPORT REGISTER

New York, Thomas International Publishing Co.

One Penn Plaza, 250 West 34th Street, New York, NY 10001, USA.

## Appendix 2

## Annotated select bibliography for basic market information

MACROECONOMIC RESEARCH

1. International Financial Statistics

   Frequency of publication: Monthly

   Publisher: International Monetary Fund (IMF), 19th and H Streets, N.W., Washington, D.C. 20431

   Price: $10 per year (including annual supplement)

2. Yearbook of National Accounts Statistics

   Frequency of publication: Annual

   Publisher: United Nations, New York

   Price: $7 (1966)

   Detailed estimates of national income and related economic measures for about 100 countries. Among the subjects discussed are: expenditure on gross national product, distribution of national income, composition of private consumption expenditure, general government revenue and expenditure, and external transactions. Published since 1958 and available on standing order.

3. National Accounts of OECD Countries, 1958-1967/Comptes nationaux des pays de l'OCDE, 384pp.

   Date of publication: 1969

   Publisher: Organisation for Economic Co-operation and Development (OECD) 2, rue André Pascal, Paris 16e

   Price: $6.50

   Statistical tables showing, for each of the member countries of OECD, including Finland, as well as for total OECD, European OECD and the EEC, the main aggregate of national accounts. Special tables give growth triangles, price and volume indices, ratios between selected aggregates.

4. National Accounts of Less Developed Countries, 1950-1966/Comptes nationaux des pays moins développés, 216pp.

   Date of publication: 1968

   Publisher: Organisation for Economic Co-operation and Development (OECD), 2, rue André Pascal, Paris 16e

   Price: $5.00

   Part I: Date on real product, population and real product per capita;
   part II: Data on growth of value added by main industrial sectors;
   part III: National accounts tables for seventeen less developed countries selected for their economic role.

5. Main Economic Indicators

Frequency of publication: Monthly

Publisher: Organisation for Economic Co-operation and Development (OECD), 2, rue André Pascal, Paris 16e

Price: $1.50 per issue, $19.50 per year (including supplements)

An essential source of statistics for the student of the international business cycle. Provides a picture of the most recent changes in the economy of the member countries of OECD, together with a collection of international statistics on economic development affecting the OECD area in the past few years.

RESEARCH ON INTERNATIONAL TRADE STATISTICS

6. Compendium of Sources: International Trade Statistics, 150pp.

Date of publication: 1967

Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

Price: $5.00, free to developing countries

Lists production statistics for 163 countries and territories.

7. Commodity Indexes for the Standard International Trade Classification, Revised, Vols.I and II (Statistical Papers, Series M, No.38) 463pp., 392pp.

Date of publication: 1963

Publisher: United Nations, New York

UN Sales Number: 64.XVII.2, 64.XVII.3

Price: Vol.I - $5.00, Vol.II - $4.50

Two volumes bringing the original Indexes up to date and classifying about 30,000 articles of commerce. Volume I consists of an item index showing for each item of the Standard International Trade Classification, Revised (SITC, Rev.), the principal articles falling within the item. Volume II begins with the SITC, Rev., followed by the Alphabetic Index, containing the result of alphabetizing all the entries occurring in the Item Index, together with new entries resulting from such rearrangements or modifications of the wording of the basic entries as were thought to be needed, amounting to about 45,000 entries. Once a product has been identified in this work, one may consult the World Trade Annual (see item 8 below).

8. World Trade Annual, Vol.I-IV, prepared by the United Nations Statistical Office

Frequency of publication: Annual

Publisher: Walker and Company, 720 Fifth Avenue, New York, N.Y. 10019

Price: $25.00 per volume, $100 for the set

This work gives data for 90 per cent of world trade. To use it, access to the Commodity Indexes for Standard International Trade Classification (see item 7 above) is essential. The four volumes contain detailed

export and import statistics for 24 developed countries: Australia, Austria, Belgium-Luxembourg, Canada, Denmark, Federal Republic of Germany, Finland, France, Greece, Iceland, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States and Yugoslavia.

9. Supplement to the World Trade Annual, Vol.I-V, prepared by the United Nations Statistical Office

Publisher: Walker and Company, 720 Fifth Avenue, New York, N.Y. 10019

Price: $50.00 per volume, $250.00 for the set

Each volume shows the trade of the 24 developed countries with other regions: Eastern Europe, Latin America, Africa and the Far East. Although this is a costly publication, every embassy and trading board should purchase it and thus help its exporters to find new markets.

10. Commodity Trade Series (Statistical Papers, Series D)

Frequency of publication: About 25 issues per year

Publisher: United Nations, New York

Price: $1.50 per issue, $25.00 per year

Issued in fascicles of about 200 pages as quarterly data become available, this series contains international commodity tables, according to the SITC, Rev., showing the imports and exports of countries reporting according to that classification (taken together, without duplication, the imports and exports of these countries cover about 90 per cent of world trade). Within commodity headings trade is analysed by country, region of provenance and destination. Figures are in US dollars and metric units of quantity.

11. Yearbook of International Trade Statistics

Frequency of publication: Annual

Publisher: United Nations, New York

Price: $11.50 (1964)

A compilation of national tables showing annual figures for several years for over 138 countries, and summaries of trade by large commodity classes and by principal regions and countries. Published since 1951 and available on standing order.

12. Trade by Commodities: Market Summaries/Echanges par produits. Résumé par marché (Foreign Trade Statistics, Series C)

Frequency of publication: Half-yearly

Publisher: Organisation for Economic Co-operation and Development (OECD) 2, rue André Pascal, Paris 16e

Price: $19.50 per year

Detailed information on the trade of OECD countries by commodities (defined according to the SITC) and partner countries. Data in terms of both value and quantity are presented in synoptic tables, bringing

together the countries comprising the market for a commodity, as outlets and/or sources of supply. This series has been published since 1959, and its presentation is now in three volumes: General, Imports, Exports. While this work is less detailed than the World Trade Annual (see item 8 above), it is much less costly.

13. Trade Yearbook

Frequency of publication: Annual

Publisher: Food and Agriculture Organization of the United Nations (FAO), Via delle Terme di Caracalla, Rome

Price: $6.00

Covers about 200 agricultural products throughout the world.

14. Foreign Trade: Analytical Tables (Imports, Exports) (German and French)

Frequency of publication: Quarterly in two volumes

Publisher: Statistical Office of the European Communities, 170, rue de la Loi, Brussels 4

Price: BF 850 per year

RESEARCH ON PRODUCTION STATISTICS

15. Compendium of Sources: Basic Commodity Statistics,[1/] 232pp.

Date of publication: 1967

Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

Price: $5.00, free to developing countries

16. Production Yearbook

Frequency of publication: Annual

Publisher: Food and Agriculture Organization of the United Nations (FAO), Via delle Terme di Caracalla, Rome

Price: $9.00

17. Commodity Yearbook

Frequency of publication: Annual

Publisher: Commodity Research Bureau, 82 Beaver Street, New York, N.Y. - 10005

Price: $14.00

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1/ The products described in this work are listed in ~~appendix 3~~, page 70

RESEARCH ON TRADE ASSOCIATIONS

18. Manufacturing and Trading Associations in Twenty-Eight Countries, (trilingual: English/French/Spanish), 93pp.

    Date of publication: 1966

    Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

    Price: Free to developing countries

19. Europa Yearbook: Vol.I, International Organizations and Europe; Vol.II, Asia, the Americas, Africa, Australasia, 1,316pp., 1,664pp.

    Frequency of publication: Annual

    Publisher: Europa Publications Ltd., 18 Bedford Square, London, W.C.1

    Price: £ 13

20. European Companies, a Guide to Sources of Information, 2nd ed., compiled and edited by G. P. Henderson

    Date of publication: 1966

    Publisher: CBD Research Ltd., 114 High Street, Beckenham, Kent, UK

    Price: $13.50

21. Trade Directories of the World, compiled by U. H. E. Croner

    Frequency of publication: first published 1952, monthly amendments

    Publisher: Croner Publications Inc., 211-03 Jamaica Avenue, Queens Village, N.Y. 11428

    Price: $20 (incl. amendment service)

    Loose-leaf format with monthly amendments.

DESK RESEARCH ON DEMAND

22. McGraw-Hill Encyclopedia of Science and Technology, 15 vols.

    Date of publication: 1966

    Publisher: McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York, N.Y. - 10035

    Price: $370

23. Materials Handbook, an Encyclopedia for Purchasing Agents, Engineers, Executives, and Foremen, by G. S. Brady, 9th ed., 968pp.

    Date of publication: 1963

    Publisher: McGraw-Hill Book Co., 330 West 42nd Street, New York, N.Y. - 10036

    Price: $19.50

24. Demographic Yearbook (bilingual: English/French)

Frequency of publication: Annual

Publisher: United Nations, New York

Price: $11.00 (1967)

International demographic statistics for over 250 countries and territories. Basic data on area, density, population growth rates, natality, mortality, life expectancy, nuptiality and divorce. Each issue also includes extended data on a special demographic topic. Published since 1949 and available on standing order.

25. Statistical Yearbook (bilingual: English/French)

Frequency of publication: Annual

Publisher: United Nations, New York

Price: $15.00 (cloth); $11.00 (paper) - 1965 volume

Annual statistical data for more than 270 countries and territories covering a wide range of economic and social subjects, including: population, agriculture, manufacturing, construction, transport, trade, balance of payments, national income, education and culture. Published since 1949 and available on standing order.

26. Sources statistiques des études de marchés/Sources of Statistics for Market Research, guides prepared by C. Kapferer

| | | |
|---|---|---|
| Vol.1 | Appareils de radio/Radio Sets, 1961 | Price: $6.50 |
| Vol.2 | Chaussure/Footwear, 1962, Europe and North America | Price: $10.00 |
| Vol.3 | Statistiques generales/General Statistics, 1964, France, Fed. Rep. of Germany, Italy | Price: $2.50 |
| Vol.4 | Appareils ménagers/Household Appliances, 1963 Europe and North America | Price: $6.50 |
| Vol.5 | Machines-outils/Machine Tools, 1963, Europe and North America | Price: $3.00 |
| Vol.6 | Produits pharmaceutiques/Pharmaceuticals, 1963, Europe and North America | Price: $6.50 |

Publisher: Organisation for Economic Co-operation and Development (OECD), 2, rue André Pascal, Paris 16e.

27. Social Statistics: Special Series of Economic Accounts, (bilingual: French/German or Dutch/Italian)

Frequency of publication: 4 to 6 issues per year

Publisher: Statistical Office of the European Communities, 170 rue de la Loi, Brussels 4

Price: BF 1,200 whole series; BF 200 per issue

Seven issues: one for each EEC member country and a general survey.

INFORMATION ON PRICES

28. Sources of Commodity Prices, compiled by P. Wasserman, 170pp.

Date of publication: 1959

Publisher: Special Libraries Association, 31 East Tenth Street, New York 5, N.Y.

Price: $5.00

This work is limited to American and Canadian journals. The body of the work is an alphabetical list of commodities. For each commodity the following information is provided: name of commodity, title of periodical publishing the price, market or markets in which price is effective and the frequency with which prices appear in the periodical. The appendix gives an alphabetical list of periodicals covered in the main part of the book, together with publisher, address of publisher and frequency of publication.

29. Agricultural Statistics (bilingual: German, French)

Frequency of publication: At least 8 issues yearly

Publisher: Statistical Office of the European Communities, 170 rue de la Loi, Brussels 4

Price: BF 450 per year; BF 75 per issue

Each issue is divided into 3 parts: agricultural costing, agricultural prices and price indices.

30. Wall Street Journal

Frequency of publication: Daily

Publisher: Dow Jones and Co., 30 Broad Street, New York, N.Y. - 10004

Price: $30 per year

Leading American financial paper.

31. Oil, Paint and Drug Reporter

Frequency of publication: Weekly

Publisher: Schnell Publishing Co., 100 Church Street, New York, N.Y. - 10007

Price: $15.00 per year

32. International Customs Journal

Frequency of publication: Irregular

Publisher: International Customs Tariff Bureau, 38, rue de l'Association, B-1000 Brussels

Price: Available only from the competent national administrations (finance, customs, etc.) of member countries. Price varies. Contains complete, updated tariff schedules for selected countries.

33. Deutsches Handelsarchiv (German Trade Archives)

Frequency of publication: Twice monthly .

Publisher: Bundesministerium für Wirtschaft, Bonn, Federal Republic of Germany

Price: DM 110 per year

World-wide coverage of tariffs and trade regulations, changes and trade agreements. Up-to-date information.

34. International Commerce, prepared by the US Department of Commerce

Frequency of publication: Weekly

Publisher: US Government Printing Office, Washington, D.C. 20402

Price: $16.00 per year, $5.00 additional for foreign mailing

A special Foreign Government Actions column covers changes in tariffs and trade regulations all over the world.

International Commerce Reprints: World-wide Tariff Guide
World-wide Customs Data
World-wide Import Rates

35. Croner's Reference Book for World Traders, edited by B. K. Bridges, 400pp.

Date of publication: 1966

Publisher: Croner Publications, 211-03 Jamaica Avenue, Queen's Village, N.Y.

Price: $25.00, including amendment service

Loose-leaf handbook with a monthly amendment service, covering all the countries in the world. Contains general background information, documentation requirements, packing, marking and labelling, various certificates required, import and exchange controls, transportation and insurance.

36. Exporter's Encyclopedia, 830pp.

Date of publication: 1969

Publisher: Dun and Bradstreet Publications Corp., P.O.B. 3088, Grand Central Station, New York, N.Y. - 10017

Price: $50.00, including up-to-date supplements

Import and exchange regulations, general export information on law, export terms and control, shipping, packing, marking of origin and other rules, all on an individual country basis for 220 world markets.

37. Export Documentation, 3 vols.

Date of publication: 1967, yearly updating supplements

Publisher: Associated Chambers of Manufacturers of Australia, Industry House, Canberra

Price: $20.00 per volume, $6.00 for yearly supplements

Loose-leaf handbook with regular amendment service. Covers all countries and lists their requirements on documentation, import and exchange controls, tariffs, packing, packaging, marking, labelling, sanitary and other required certificates.

38. International Advertising Standards and Practices

Publisher: International Advertising Association, 475 Fifth Avenue, New York, N.Y. - 10017

Contains general information on advertising in 60 countries

MISCELLANEOUS SOURCES

39. Export Marketing Research for Developing Countries

Date of publication: 1967

Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

Price: $5.00, free to developing countries

40. An Annotated Bibliography of Market Surveys by Products and Countries

Date of publication: 1969

Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211, Geneva 10

Price: $5.00, free to developing countries

41. Handbook on the International Exchange of Publications, 3rd rev. ed., (quadrilingual: English/French/Russian/Spanish), 767pp.

Date of publication: 1964

Publisher: United Nations Educational, Scientific and Cultural Organization (UNESCO), Place de Fontenoy, 75 Paris 7e

Price: $8.50

Chapters on: different types of exchange, the organization of national and international exchange services; conventions and agreements for the exchange of publications; transport and customs; list of exchange offers of international organizations; etc. A select list of current international directories, a subject index and an index to countries are also provided.

42. Ulrich's International Periodical Directory, a Classified Guide to Current Periodicals, Foreign and Domestic, 14th ed., 2 vols.

Frequency of publication: Annual

Publisher: R. R. Bowker Co., 1180 Avenue of the Americas, New York, N.Y. - 10036

Price: $30.00

This directory can be used to identify periodicals dealing with specific products.

43. Compilation of Basic Information on Export Markets

Date of publication: 1968

Publisher: International Trade Centre (ITC) UNCTAD/GATT, Palais des Nations, CH-1211 Geneva 10

Price: $5.00, free to developing countries

More general information is available from such sources as:

The selected commodity price publications of

Merrill Lynch, Pierce, Fenner and Smith, Inc.
70 Pine Street
New York, N.Y. - 10005;

The publications of the Food and Agriculture Organization of the United Nations (FAO), Via delle Terme di Caracalla, Rome, on the prices of agricultural goods;

The catalogues of mail-order houses, for the prices of consumer goods;

Commodity exchange quotations;

The various trade journals for industrial products.

44. SPECIAL CALCULATORS: HEWLETT PACKARD PERSONAL COMPUTER DIGEST

HEWLETT-PACKARD COMPANY.
1000 NORTH EAST CIRCLE BLVD., P.O. BOX 999
CORVALLIS, OREGON 97330 U.S.A.

OTHER BOOKS: INVESTMENT ANALYSIS AND STATISTICAL APPLICATIONS (90026)
MARKETING AND FORECASTING APPLICATIONS (90049)

U.S. SALES RETAIL COMPUTER CENTRE INC:
28251 FORD ROAD
GARDEN CITY, MICHIGAN 48135 U.S.A
TELEPHONE: (313)-261-0424

PRICE EXAMPLE. HP 12C - £90- +S...
41C - £150- " "
41CV - £210- " "

45. NIGERIAN CONSULTANTS ORGANIZATION:

INSTITUTE of MANAGEMENT CONSULTANTS - IMC.
14 KAGORO CLOSE
P.O. BOX 9194
KADUNA, NIGERIA
TEL. 062. 211437

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept – 14 Oct 1983
Materials used by
Mark Weber

# T E A C H I N G
# M A T E R I A L S
# A N D
# O U T L I N E S
# F O R
# S L I D E S

PRICING POLICY

Refer Section: 13
Module: II

MARKET and DEMAND

PRICING POLICY

ALTERNATIVE METHODS OF PRODUCT PRICING :

THE COST APPROACH :

TOTAL COSTS PLUS PROFIT :

| COSTS: | TOTAL (Gross) | per UNIT (At PRODUCTION CAPACITY) |
|---|---|---|
| RAW MATERIALS: | | |
| DIRECT LABOR : | | |
| INDIRECT LABOR : (Associated w/ Production) | | |
| UTILITIES : | | |
| SUB-TOTAL= VARIABLE COSTS | | |
| OVERHEADS : | | |
| INDIRECT LABOR : (Not Associated w/ Production) | | |
| ADMINISTRATION : | | |
| AMORTIZATION of : EQUIPMENT & FACILITIES | | |
| INTEREST/FINANCING COSTS | | |
| PRODCUTION TAXES : | | |
| SUB-TOTAL = FIXED COSTS | | |
| TOTAL/VARIABLE and FIXED COSTS | | |
| ADD : PROFIT AND TAXES : (Based on a pre-determined R.O.I.) | | |
| TOTAL PRODUCTION COSTS: | | |

IRIDO SYSTEM

- - FACTORY COST - (Variable)

(incl. SALES/DISTRIBUTION COSTS)

- - OPERATING COST - - -

* - PRODUCTION COST - - - -

IS THIS UNIT COST THE COST AT ALL LEVELS OF PRODUCTION ?

MARKET and DEMAND

PRICING POLICY (2)

PROBLEMS WITH THE COST APPROACH :

1. Not reflective of ACTUAL UNIT COST

   DURING START-UP PERIOD
   IF MAXIMUM CAPACITY IS NOT REALIZED :
   - DUE TO TECHNICAL DIFFICLUTIES
   - DUE TO LACK OF SUFFICIENT DEMAND

2. Not reflective of MARKET CONDITIONS

   COMPETITION :

   - FROM OTHER PRODUCERS
   - FROM IMPORTS(Including Smugling)
   - FROM CONSUMMER SUBSTITUTION

   WHAT ABOUT CONSUMMER'S MARGINAL WILLINGNESS (AND, IN SOME CASES, ABILITY) TO PAY ie;

   THE SUPPLY/DEMAND CURVE ?

BASIC NEED TO COVER 'VARIABLE COSTS '

HOW LONG TO WAIT BEFORE PROFIT PROJECTIONS CAN BE REALIZED ?

CONTRIBUTIONS TO OVERHEADS :

GRADUAL ABSORPTION BY MARKET OF FIXED COSTS

ALTERNATIVES :

MONOPOLY GIVEN BY GOVERNMENT FOR INITIAL PERIOD

IMPORT RESTRICTIONS

TARIFF OR QUOTA BARRIERS

RETURN TO PROBLEM OF PLANT CAPACITY SIZE :

'OPTIMUM ECONOMIC PLANT SIZE'

THE ''LEARNING CURVE'

OR PRODUCTION START-Up CURVE

MARKET and DEMAND

PRICING POLICY (3)

PRICE DETERMINATIONS : OUTPUTS :

IF IMPORT SUBSTITUTIONG :

OUTPUTS MIGHT BE PRICED AT :

C.i.f. PRICE, including
IMPORT TAXES AND DUTIES,
INTERNAL AND PORT CHARGES FOR CLEARING and TRANSPORT TO WHAREHOUSES
INSURANCE, etc.

IF PRODUCT IS ALREADY MARKETED INTERNALLY :

OUTPUTS MUST BE REFLECTIVE OF THE COMPETITIVE PRICE STRUCTURE TKAING INTO CONSIDERATION QUALITY DIFFERENCES

IF PRODUCT IS DESTINED FOR EXPORT :

OUTPUTS MUST RELECT COSTS TO DELIVER TO THE EXPORT MARKET--UNLESS :

PROJECT IS UNDERTAKEN TO EARN FOREIGN EXC
THEN A GOVERNMENT SUBSIDY, OR SOME ADVAN
FROM FOREIGN EXCHANGE MUST BE FACTORED IN
THE PROJECT PROFITABILITY

PRICE DETERMINATIONS : INPUTS :

IF MATERIALS ARE IMPORTED, PRICE/COST VALUE SHOULD BE ACTUAL C.i.f. PRICE PLUS CHARGES

IF MATERIALS ARE LOCALLY PRODUCED :

COSTS FOR THE FINANCIAL ANALYSIS OF THE PROJECT PROFITABILITY SHOULD BE BASED ON COSTS PREVAILIN IN THE LOCAL MARKET. WHERE NO LOCAL MARKET EXIS THE COST F.o.b. THE PORT OF EXIT FOR EXPORTED RA MATERIALS WOULD SEEM APPROPRIATE

THE HANDOUT ON PRICE DETERMINATION AND GOVERNMENT PRICING POLICY

**ANNEX 8: Teaching Materials and Outlines for Slides, Module III: Technical Analysis**

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NIGERIA.

J.A. Kopytowski

# MODULE III

## TECHNICAL ANALYSIS

Lectures and exercises.
Table of contents:

1. Overview of the technical analysis.
2. Technical aspects of the production programme and plant capacity.
3. Production schedule. Exercise.
4. Materials and inputs.
5. Materials and inputs. Exercise.
6. Technology. Technology transfer.
7. Technology selection. Exercise.
8. Technology cost. Exercise.
9. Project engineering.
10. Manpower. Training.
11. Labour requirements. Exercise.
12. Project implementation.
13. Negotiations of the contracts.

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## Chapter I. Overview of the technical analysis.

Lecture content:

1. Time sequence of different activities in the project development.
2. Hierarchy of preparatory activities.[1/]
3. Procedures and stages of project development.
4. What is to be designed? [2/]
5. How extensive should engineering study be? [3/]
6. Technical aspects of the project feasibility.
7. Investment-production cycle. Impact of different variables on feasibility of the project.

Comments:

---

1/ Every action which is to be undertaken in any of the systems belongs to the one of the stages:

- preparatory stage
- realization stage

Sometimes preparatory stage is performed several miliseconds before realisation /action of the boxer/, but very often preparatory action is overtaking the realisation stage long time /erection of big dam/. This classification is of the hierarchical character. It means that the previous action is preparatory to the following one. But also in the preparatory action one clearly define the preparatory and realization stage.

Industrial development which is time dependent change of production and economical structures needs also preparatory stage.

Production of goods and commodities needs to use installations, plants. This physical structure needs to be artificially erected and afterwards operated at the flow of materials and using energy, managerial and workers skill.

It means that erection of the facility, is a preparatory stage in the context of the production stage. What is than preparatory stage for the physical process of the plant erection. Of course those are all activities described as design and engineering, to which preparatory is the decision to undertake such investment.

Feasibility study serves to help this decision making process.

---

2/ Definitions:

Function-transformation of a state of flow which can be measured by change of at last one of parameters of this flow.
Processing element-Piece of hardware having structural properties
Processing unit-set of processing elements which can perform at least one function.
Technological unit-set of processing units transforming marketable input to salable output.

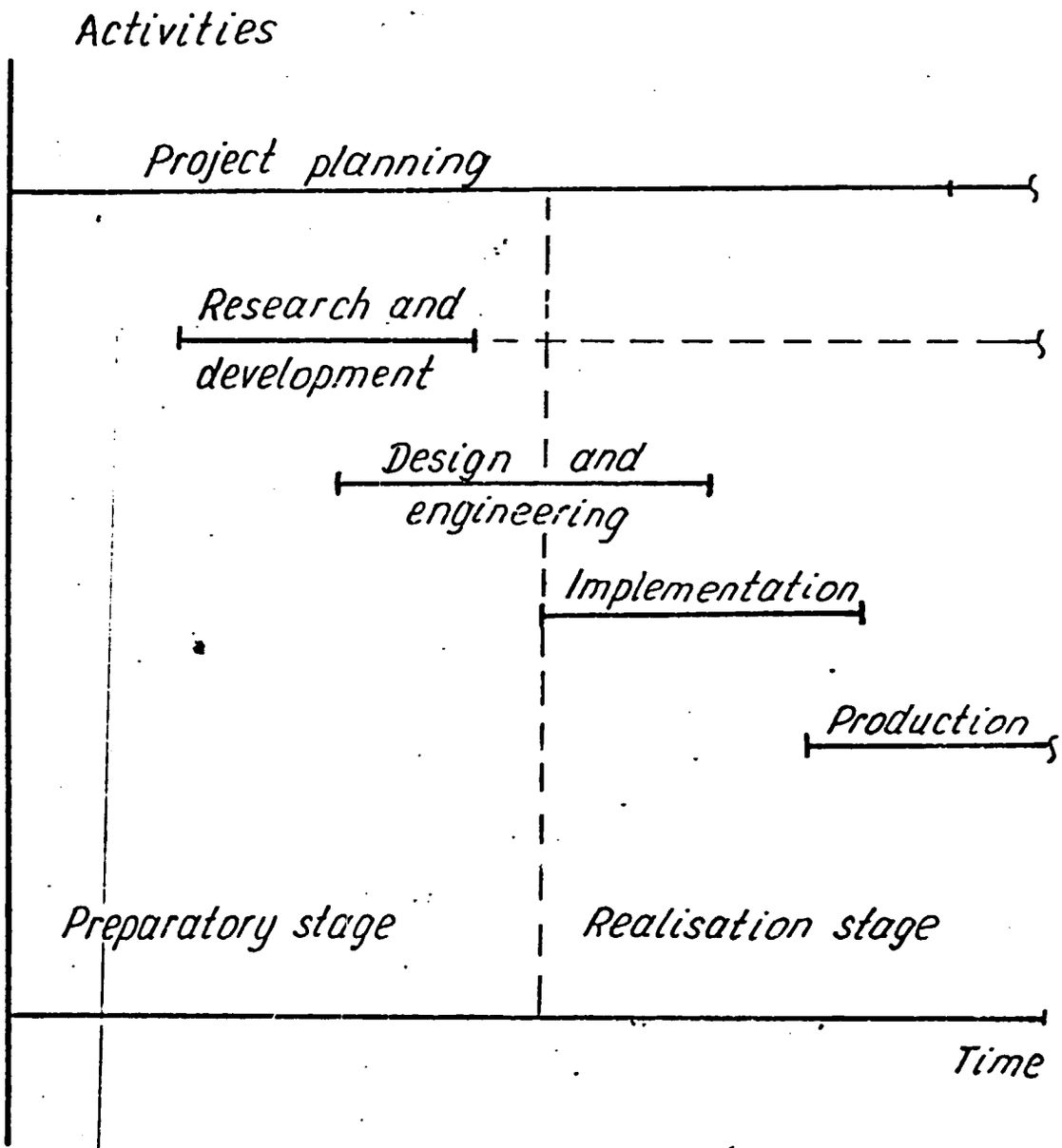
Installation-technological unit supported by service chains/like water, energy, conveyers, storages ets.

Plant-set of installations which under management functions can perform technically autonomously.

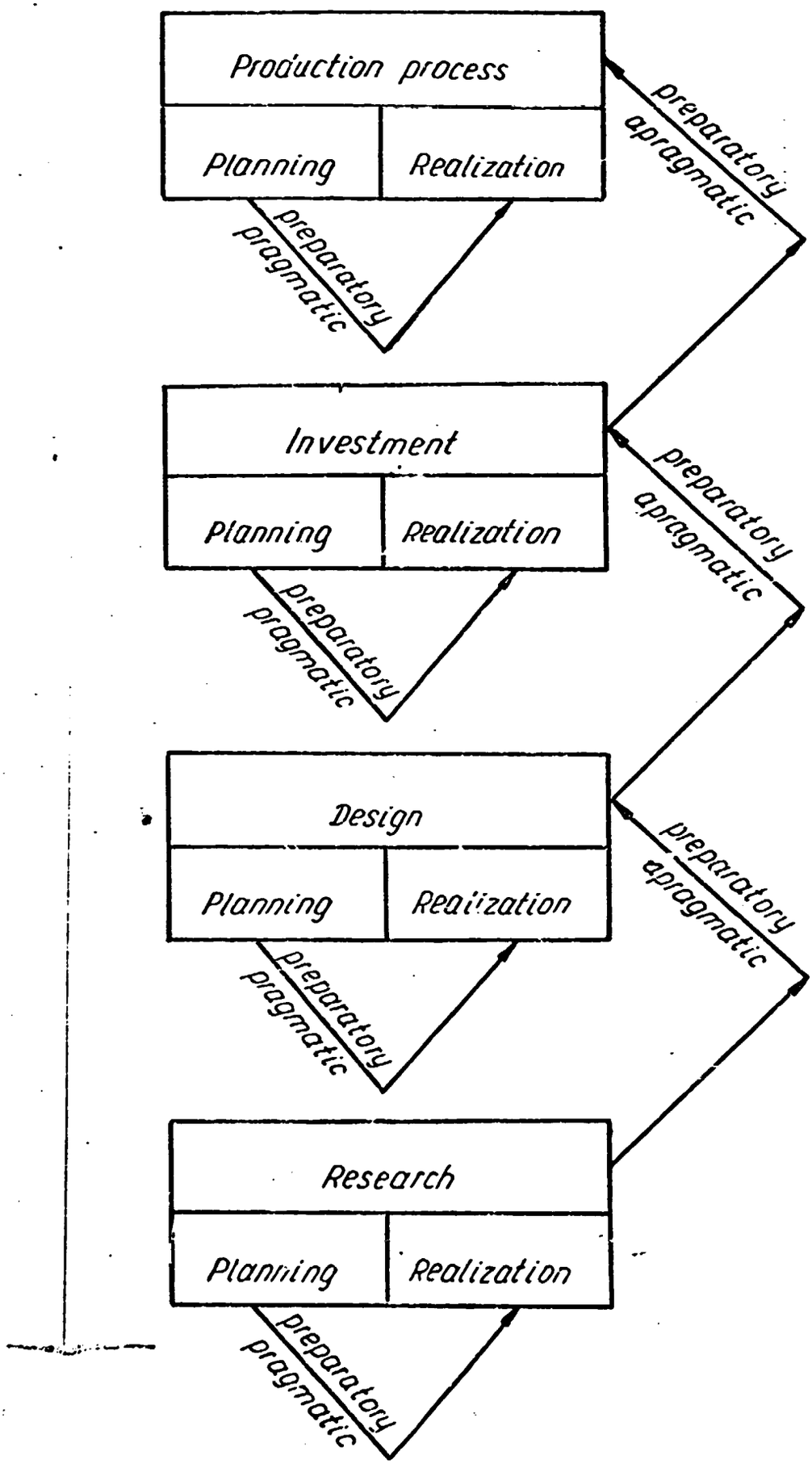
Enterprise-at least one plant organized to perform economical function
Company-at least one enterprise with financial functions.

---

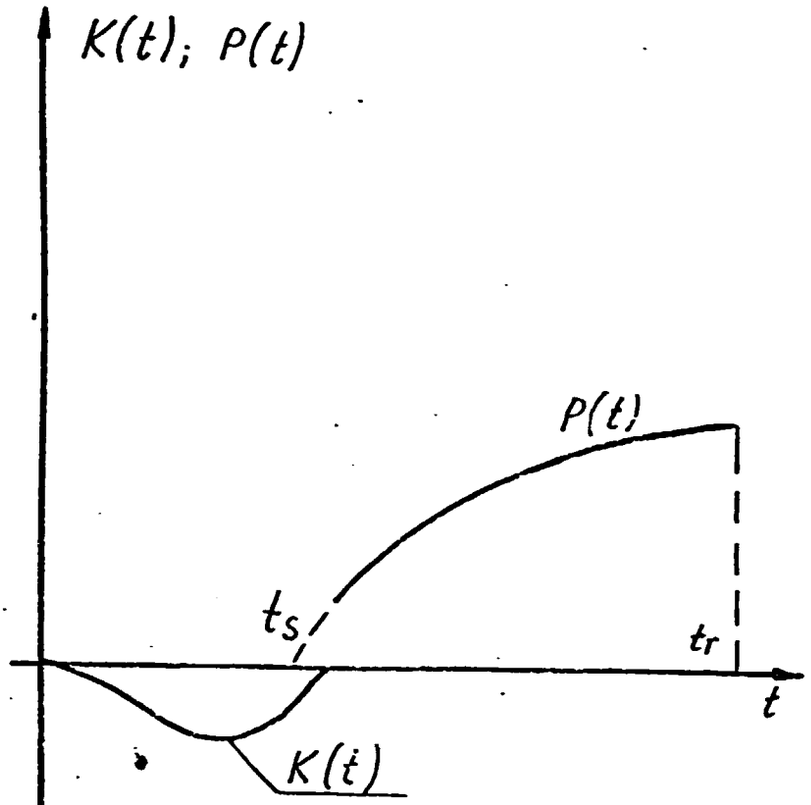
3/ Research and design cost is growing exponentially with the volume of knowledge collected and process properties precise description. Laboratory research, models, pilot plants, engineering calculations however are introducing higher probability of the succes in the project commercial implementation. Therefore risk and cost of failure are reduced at extensive investigation of the project. Those two functions are defining the feasible range of extensivity of the engineering study.




Time sequence of different activities in the process of project development.




Hierarchy of preparatory activities.




$$\int_0^{t_1} K(t)dt \leq \int_{t_s}^{t_r} P(t)dk$$

Investment - production cycle

Properties:

a) time sequence
b) specific structure of the cost--profit areas.

$$\int_0^{t_1} K(t)\,dt \qquad \int_{ts}^{t_r} P(t)\,dt$$

a) $t_1$ value

b) cost $K(t)$

c) rate of interest

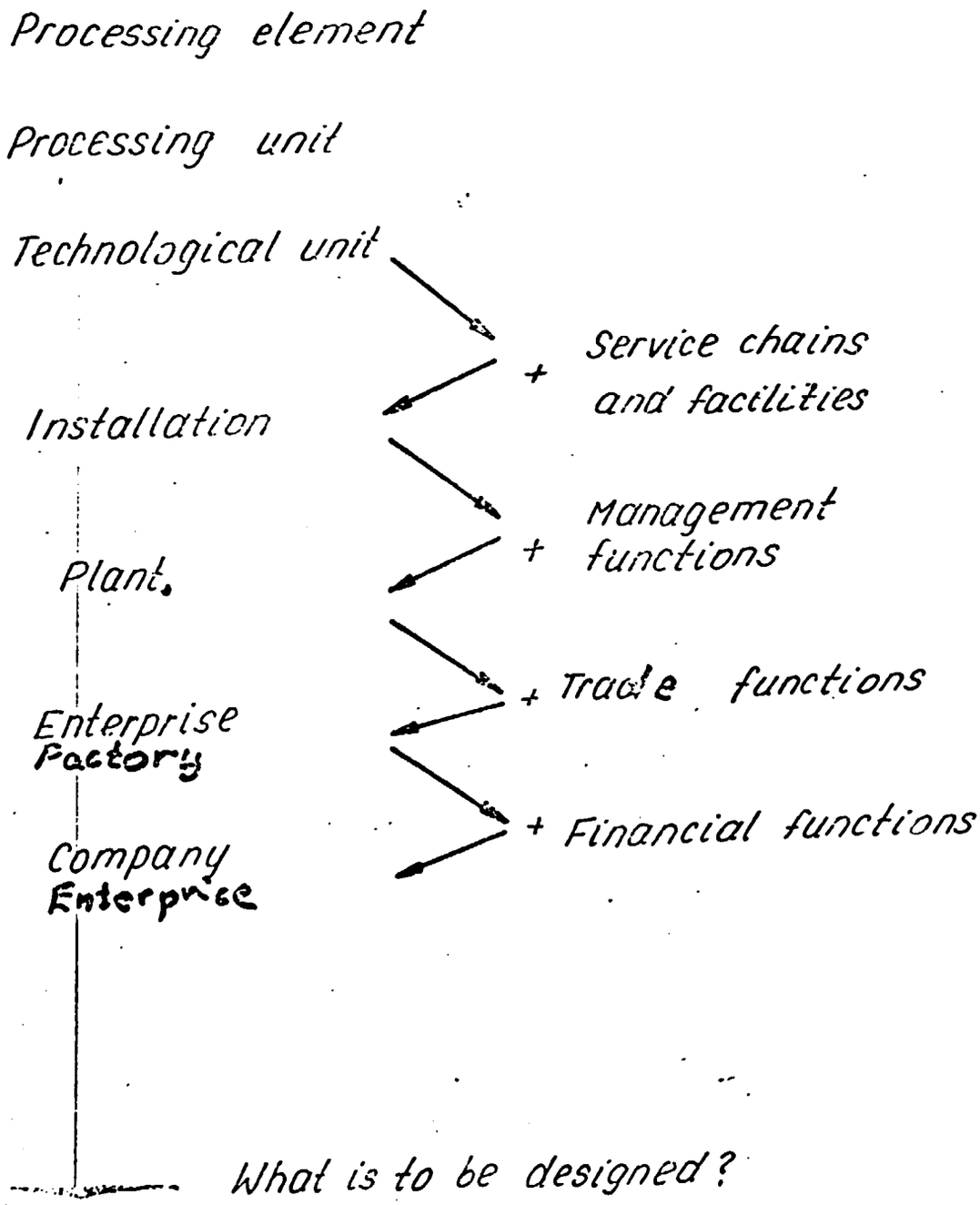
a) market demand

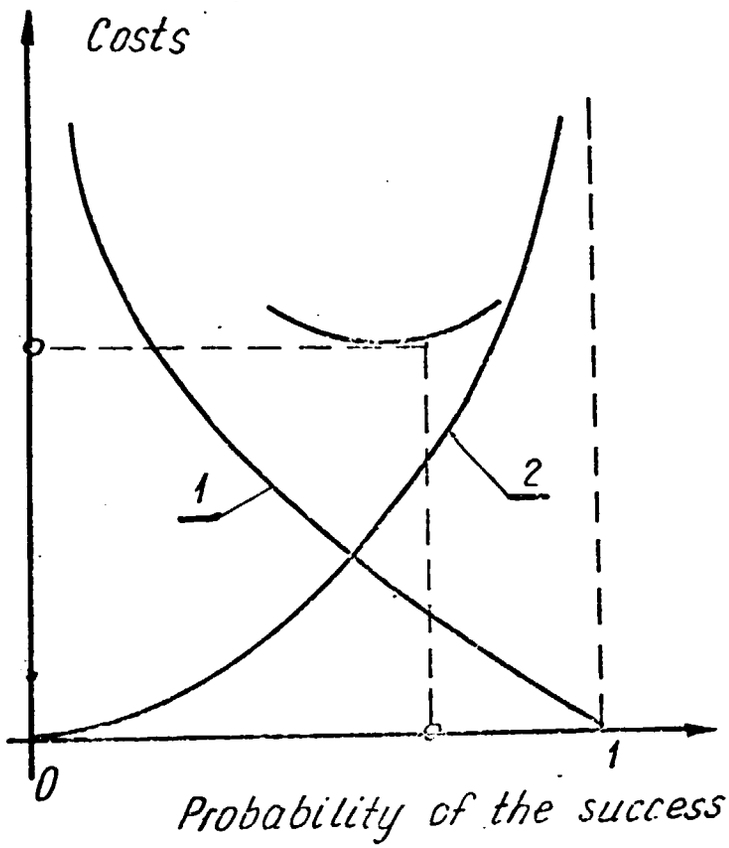
b) price of product

c) technical failures

d) production cost

Impact of different variables on economical feasibility of the project.


Processing element
Processing unit
Technological unit
Installation
Plant
Enterprise
Factory
Company
Enterprise
+ Service chains and facilities
+ Management functions
+ Trade functions
+ Financial functions
What is to be designed?

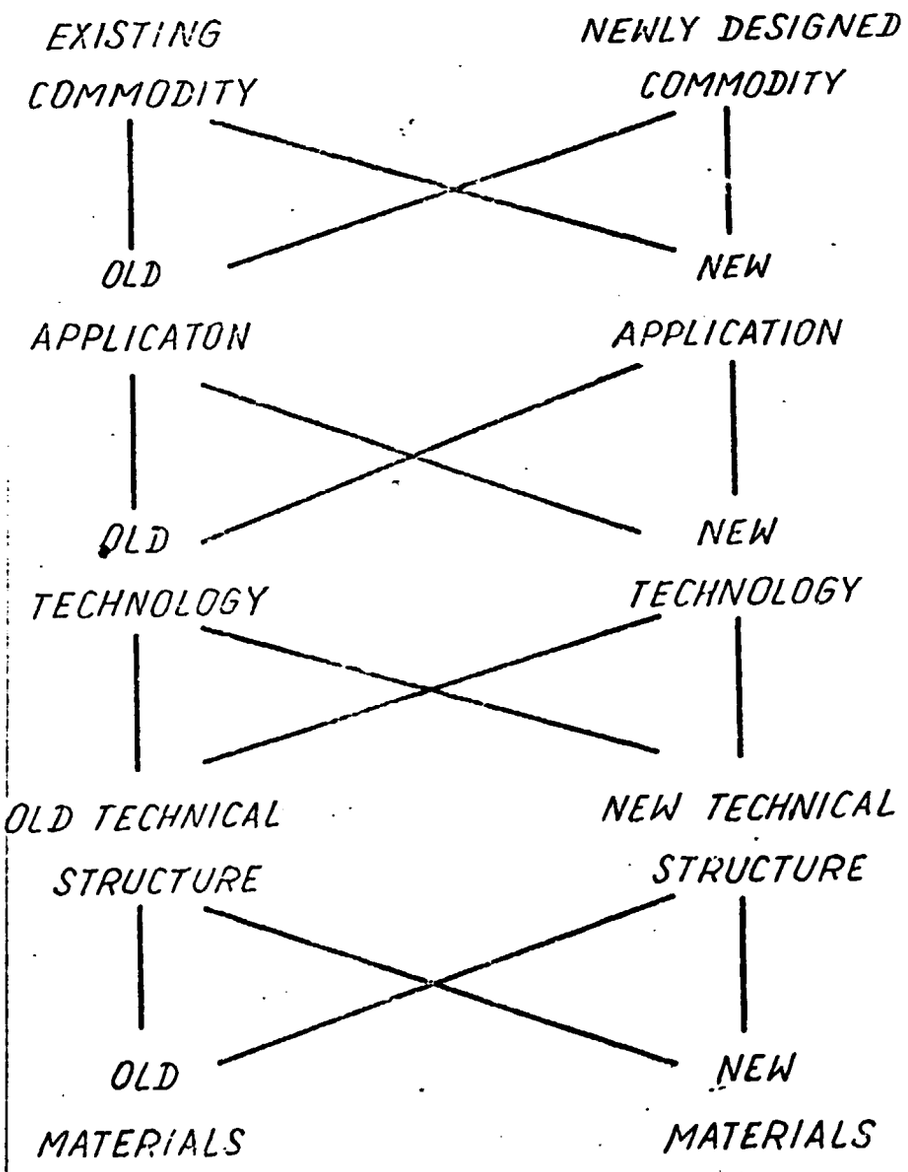



1- cost of the unfeasible solutions

2- cost of the research, design and alternatives comparision.

How extensive should engineering study be?

# EVALUATION OF GOALS OF THE PROJECT




TOTAL NUMBER OF PATHS: 32

| Assured | If properly designed |
|---|---|
| | Market |
| Goal feasibility | Production programme |
| Functional feasibility | Design and engineering |
| Technical feasibility | Technology |
| Resources feasibility | Materials and inputs |
| Infrastructural feasibility | Location and site |
| Implementation feasibility | Investment realization |
| Operational feasibility | Production realization |
| Human feasibility | Manpower and management |
| Environmental feasibility | Development programme |

Aspects of project feasibility.

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Chapter II. Technical aspects of the production programme and plant capacity.

Lecture content:

1. Production programme over the life span of the plant.1/
2. Scheduling of the production process. Cases of productio. schedule.
3. Plant capacity concept.2/ Relations between different capacity concepts.
4. Relation between plant capacity and production cost.
5. Is the capacity technically unlimited? Physical, technological logistic and marketing options and constraints of the plant capacity.3/
6. Optimum economic capacity of the installation.

Comments:

1/ Evaluated on the basis of marketing studies and sectoral analysis product demand has to be translated into production programme. The first problem to be discussed is demand versus time relation. Evaluated demand can be never achieved at the first year of the production. There are two main reasons of such situation:

- market is not ready to consume new product
- technical structure of the plant, skills of management and workers

Therefore from this point of view production programme is a time dependent function.

Influence of these factors are not constant during the different periods of plant operation. It could be shown that generally exists three periods of plant production schedule: the start up period, the normal operation period and obsolete technics operation period.

Type of the industry to which belongs project has another impact on production programme. Industries are working different time schedule dependend on their hard ware characteristics. All the industries we divide into two classes:

- continuously working three shifts
- interrupting process after first or second shift

In every case production process can organised batch-wise or at constant flow. It is easy to prove that in each case the production programme will be estimated differently.

---

2/ Capacity is a definition of measure of some output in agreed time period.
That incure necessity to establish the time in which we are intended to measure the output and to estimate if during that time the output can be considered as constant. The first measure is output in hour of production, the others could be monthly and yearly rates of production. But monthly and yearly rates of production are not the result of simple multiplication of the respective time on hour's output. Taking into account these remarks we can define several capacities of the same production facility:

- installed capacity /nominal time hour output/
- nominal maximum capacity /defined time x defined hour output/
- feasible normal capacity /feasible time x feasible hour output/
- statistical capacity /data collected from reports/

What are major factors which infringe possibility to operate plants with installed capacity:

- natural time breaks /holidays, shift patterns, combination of different machines to different products/
- technical time breaks /exchange of tools, catalysts, maintenance/
- output-input limitations /supply of raw materials and sales of products, utility supply breaks, spare parts availability/
- management system limitations /skill of managers and workers, periodical lack of labor forces, failures of the training system/
- stochastic breaks /accidents, fires, explosions

---

3/ Now it is necessary to resolve the problem of minimum economic siz of the production line and/or whole installation. Simple calcula-tions are showing that unit cost is in the relation with productio capacity of pipe, valve, reactor, and other categories of the equipment. The cost of square meter of building as well as other civil works shows the same relationship. It means that unit invest ment cost of bigger installation is lower. If that relationship would be the only one, the most economical way of every production realization is the one plant for whole the world. But of course There are many constraints to that solution. They can be divided into several groups:

- physical constraints /every kind of hard ware can be built only maximum dimensions, because of resistance of materials and weight considerations/
- technology capability /technological process is standardize and can not overcome some dimensions of principal equipment /e.g. from the point of view heat exchange volume/surface relationship/
- logistic reasons /at growing concentration of industrial un the cost of transportation, cost of the storages and cost o supply of the utilities is much larger per unit of the prod
- market reasons /market is not ready to absorb new productio and is not ready to met the demand on raw materials at the level of acceptable for the process prices./

To avoid extremely high cost of engineering studies of different sizes of the installations simple equations can be applied:

$$I_b = I_s \left( \frac{P_b}{P_s} \right)^X \qquad C_b = C_s \left( \frac{P_b}{P_s} \right)^Y$$

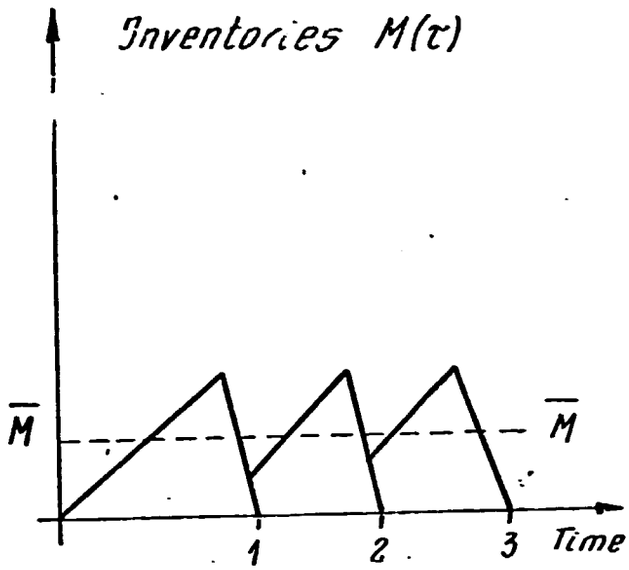
Where: $I_b$, $I_s$ - capital requirment for bigger and respectivly smaller size plants

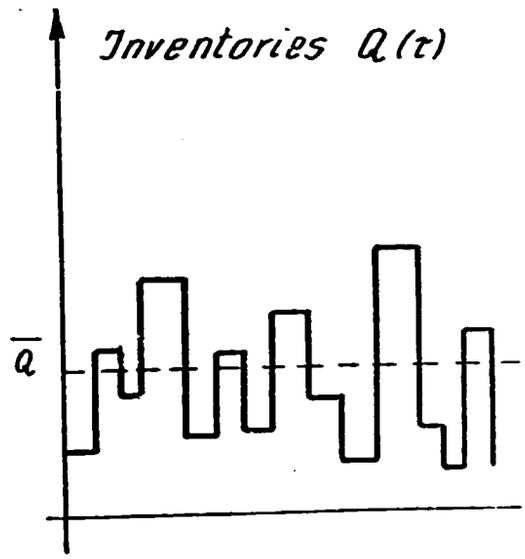
$P_b$, $P_s$ - capacities of bigger and smaller plants

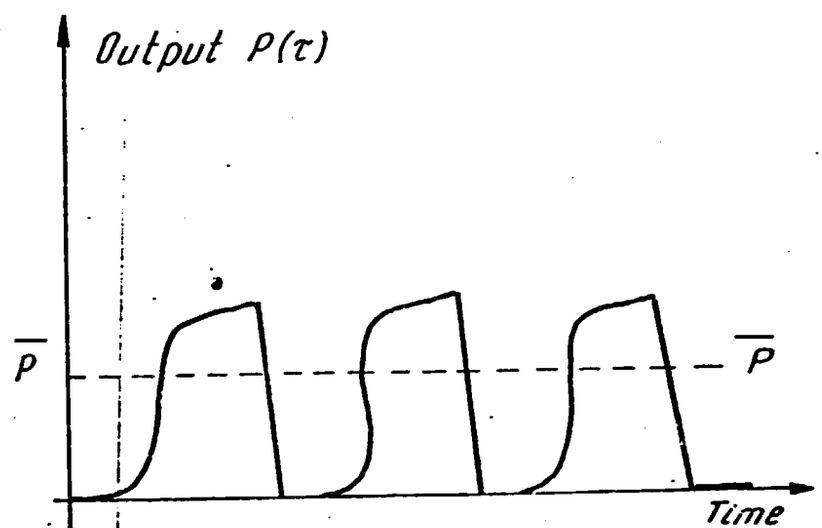
$C_b$, $C_s$ - production cost of bigger and smaller capacity pla

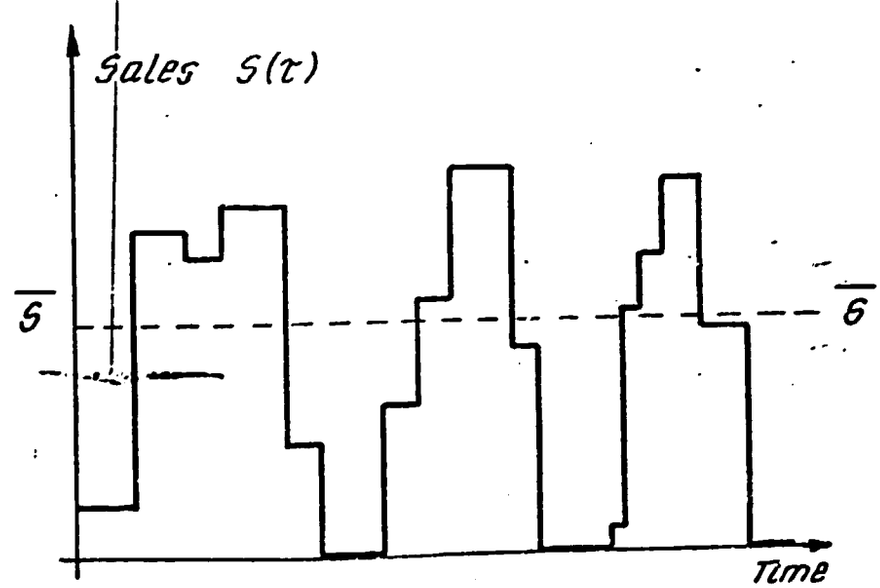
But the exponential rule has its limitations, and can be applied only in defined region of the capacities of-the equipment as well as of the complete installations.

In complicated cases where high capital involvement is expected there is necessary to prepare engineering study on the capacity of the plant. The study can be limited to critical equipment and all the rest can be added proportionally. If standard type equipment is included in the installation there it is necessary to seek complete quotations from producers for several capacities.

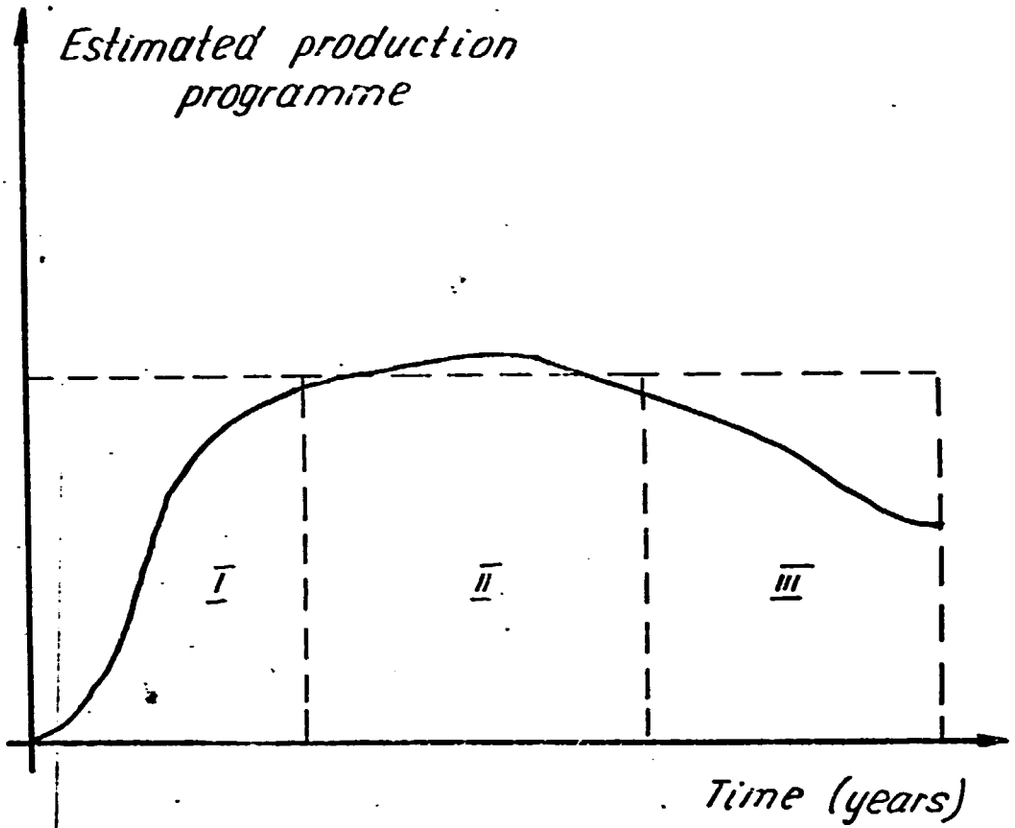



Production planning objectives

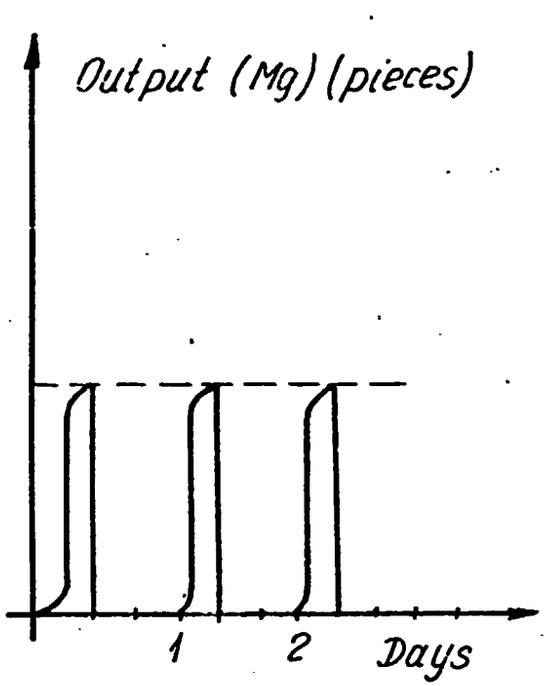


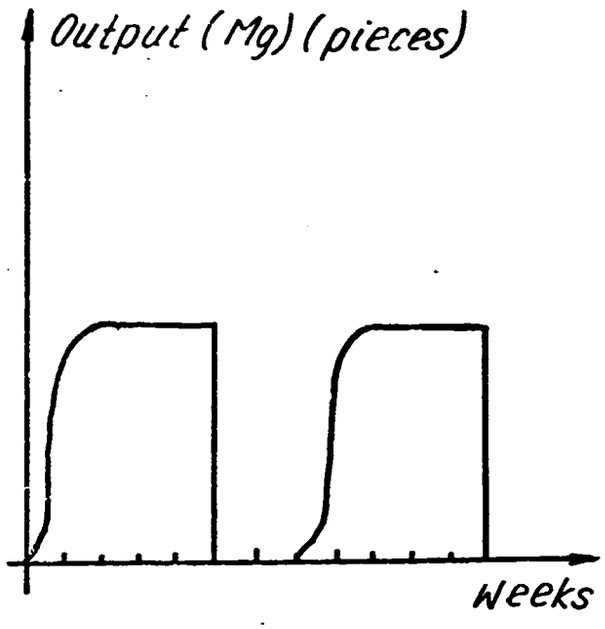

Production programme over the life span of the plant.

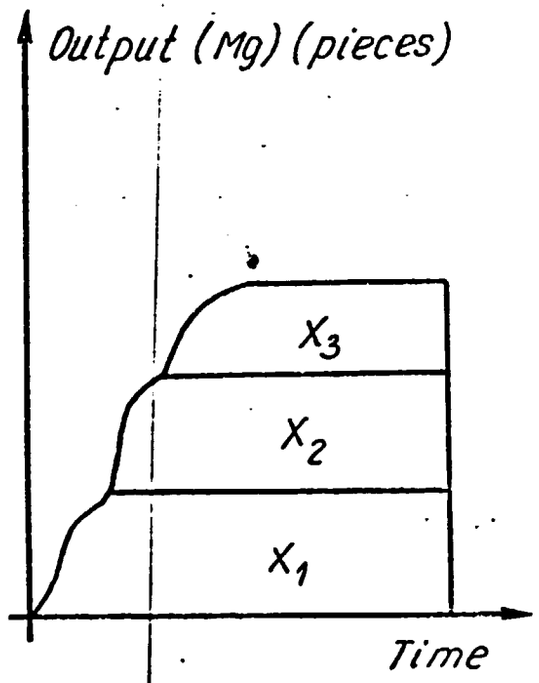
I period 2-5 years

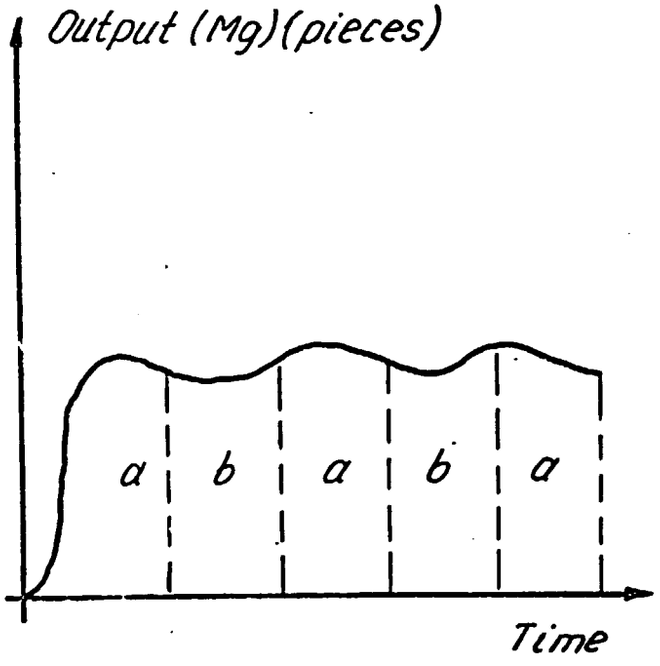
II period 10-15 years

III period 5-6 years



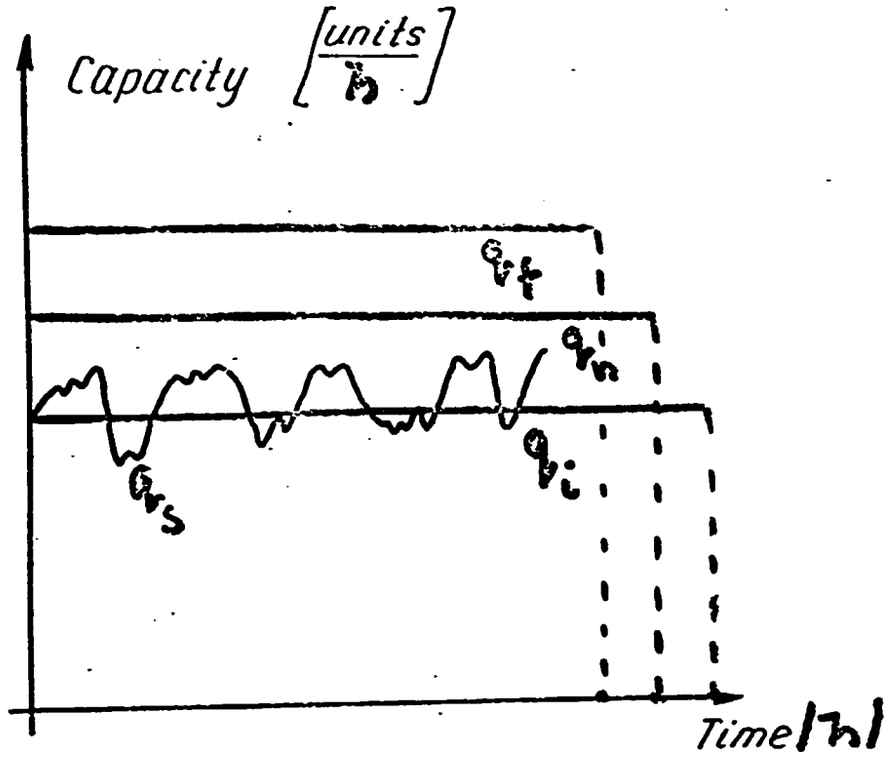

Cases of production schedule.

I - one shift per day

II - weekend break

III - multiproduct batch plant

IV - continuous seazonally adapted



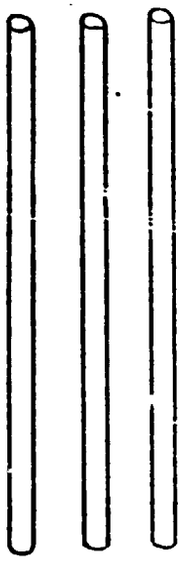

$$Q_i = q_i \times 8760 \quad \frac{units}{year}$$

$$Q_n = q_n \times 8000 \quad \frac{units}{year}$$

$$Q_f = q_f \times 7600 \quad \frac{units}{year}$$

$$q_s = \frac{\Sigma q_s \cdot te.}{T} \quad \frac{units}{year}$$

Relations between different capacity concepts.



$d = 20$

$t = 4$

$f_1 = 3,14 \cdot 10^{-4}\ m^2$

$V_1 = 30,15 \cdot 10^{-4}\ m^3$ (metal)

$g_2 = g_1 \left(\frac{f_2}{f_1}\right)^x$

$x = 0,$ [illegible]

The same capacity

$3f_1 = f_2$

Weight proportion

$\frac{3g_1}{g_2} = 1,93$

Growth factor of one tube capacity 3

Growth factor of one tube weight 1.62

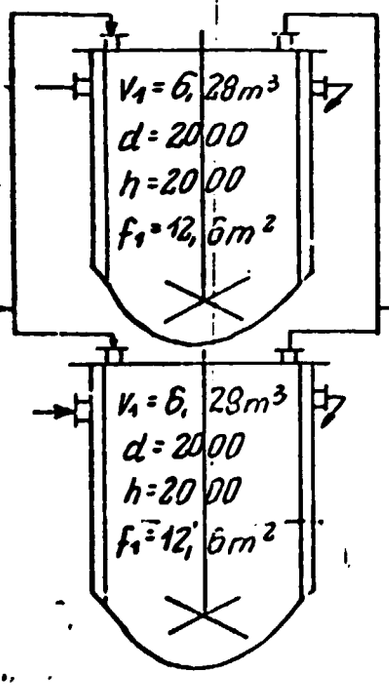
$d' = 35$

$t = 4$

$f_2 = 9,42 \cdot 10^{-4}\ m$

$V_2 = 48,38 \cdot 10^{-4}\ m$

## Economy of the scale



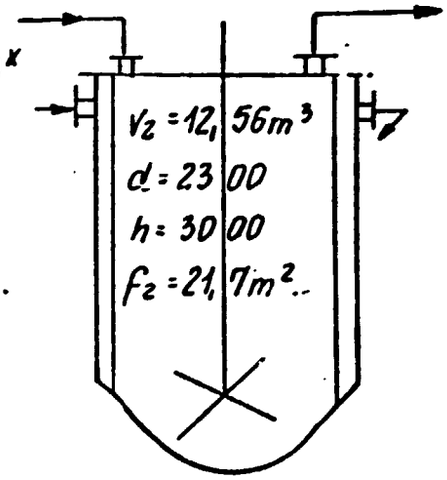

$q_1 = q_2\ (m^3/h)$

$f_2 = f_1 \left(\frac{V_2}{V_1}\right)^x$

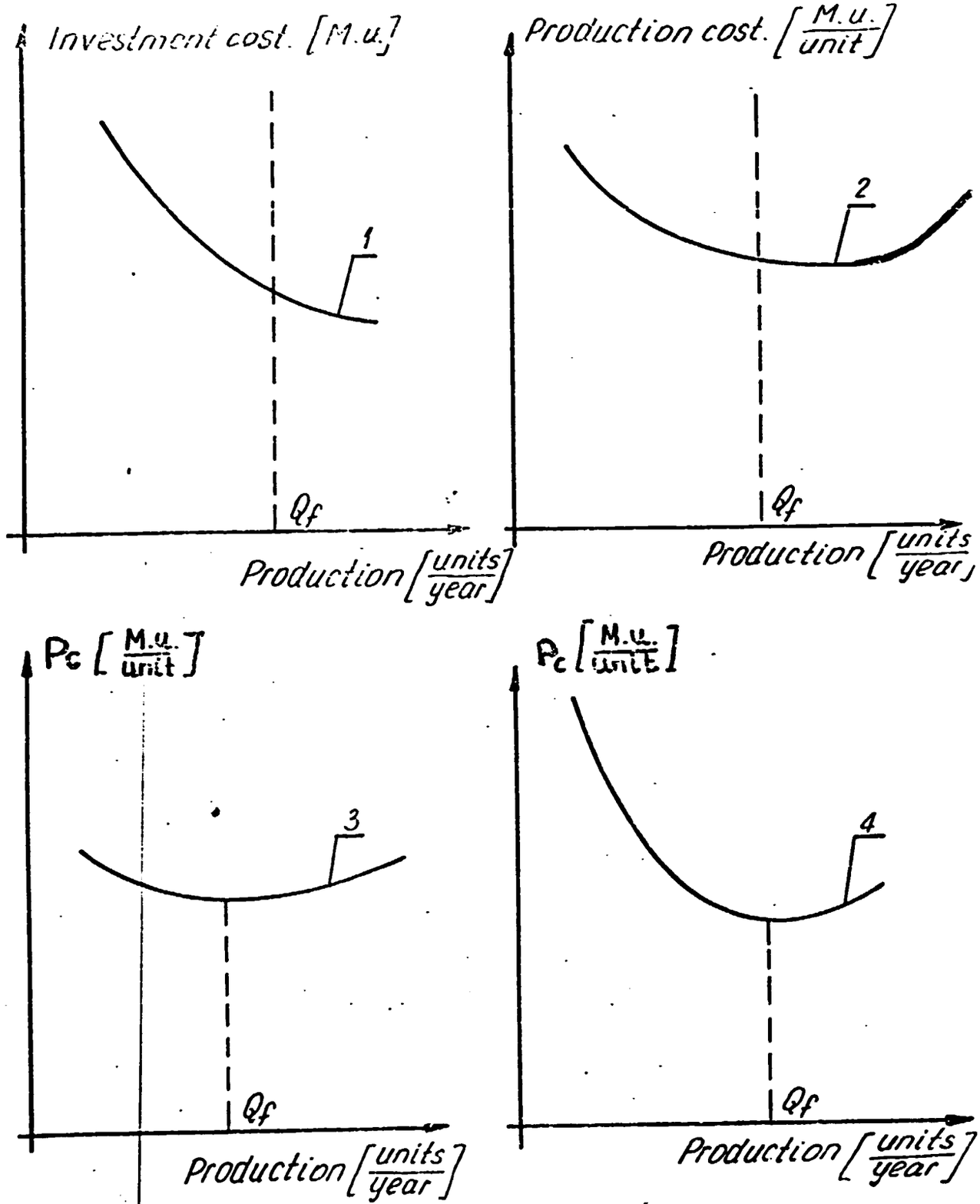
$x = 0,72$

$h = f\ \Delta t\ K$

$h_2 < h_1$




## Technological constraints of the scale growth

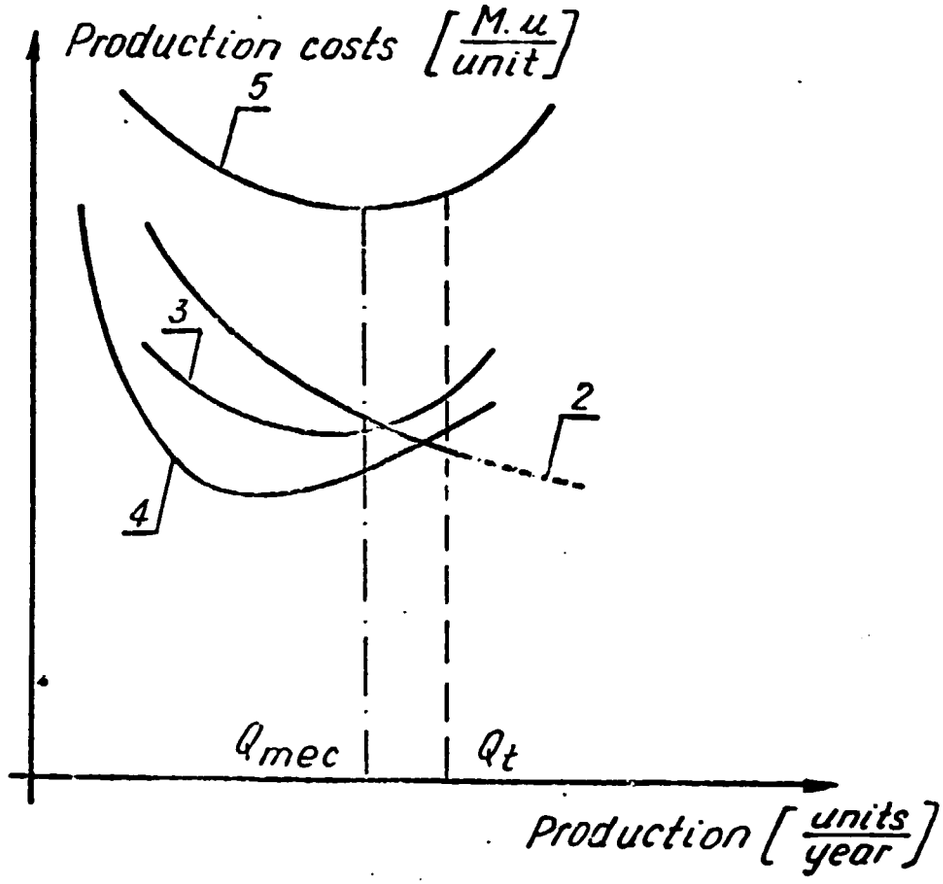



Impact of different options and constraints on minimum economic capacity.

1, 2 – physical or technological constraints

3 – logistic options

4 – marketing options




Minimum economic capacity determination.

2- investment cost

3- logistic costs

4- marketing costs

5- total costs

Training course UNIDO-CSPS

J.A. Kopytowski

Warsaw 18.10-12.12.1982

Chapter IV. Materials and inputs.

Lecture content:

1. Significance of the materials and inputs availability, quality and price for the project feasibility.
2. Classification of materials and inputs [1/]
3. Properties of the materials and inputs [2/]
4. Supply programme
5. Cost of materials and inputs [3/]
6. Utilities [4/]

Comments:

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1/ The main goal of the production process is the transformation of flows. The inputs generally depends on technology, techniques of the processing, which are adopted to defined production programme Therefore adequate range of materials or their substitutes should be in demanded quantity and quality. There is a close relationship between the definition of the input requirements and other project problems.

All the materials and inputs can be classified into several groups:

- raw materials /unprocessed and semiprocessed materials/
- processed industrial materials
- components
- auxiliary materials
- factory supplies
- utilities

Raw materials are the most important group from the point of view of availability and logistics. This group can be classified as follows:

- agricultural products
- livestock origin products
- forestry origin products
- marine and water origin products
- mineral products /mineral ores and nonmetalic minerals/

Every class of raw materials has its options and constraints when use

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2/ Quality of the raw materials is one of the crucial points in production process. Therefore careful analysis by the specialists is to be done. All properties should be listed and controlled:

- properties /physical, chemical, mechanical, electrical and other concerned/
- changes in the properties during the year
- handling, transportation and storage properties /kind of wrapping and packing is to be defined/ as well as all security prescriptions during this operations
- list of impurities which are not allowed by the technologic process
- processing properties

The most important properties of raw materials are:

- renovability - exaustability
- supply timing /seasonal - uniform distribution consumption/
- changable-stable /on quality/
- concentrated-diluted

Each property has its influence on cost of the processing. Thus assuring the deliveries of the raw materials special care has to be taken and following steps observed.

- yearly quantities should be defined and for the higher part of demand long-term agreement should be prepared
- alternative resources should be allocated
- bulk purchase arrangements should be sought
- transportation agreement long term are necessary
- wastes should be determined at different supply resources
- output/yield should be controlled at last in laboratory but sometimes the tests on industrial scale are indispensable.

Foreign raw materials should be avoided, only when comfortable exchange of the raw materials against local products is assured in the delivery contract.

Second important group of inputs are the processed materials and components. Many of the indications given for the raw materials are valid in group of inputs. Important difference is laying in the standardization of the products. Processed materials are mostly subject to international or national standards and quotations and contracts are always referring to this standards. Analysis of inputs should take this into account, but it does not mean that standard specification is sufficient for every production process. It is necessary add to specifications necessary amendments and define the methods of analysis or determination of such unspecified in standards properties.
Different situation is in the case of components which are integral part of product. Because it is impossible to assure production of all components inside the one country special precaution should undertaken to assure full and qualitative supply under changeable conditions of the market. The first princip here is to avoid one supplier of the components, and than some kind of standardization is also necessary. The best solution is unconditional exchange of the components with supplier, on the balance rate of exchange.
The original producer is sometimes quickly changing the final product and than this arrangements is very important to avoid unnecessary development of the process, just started at nonreimbursed.
Third group of inputs concerns the auxiliary materials and factory supplies. Auxiliary materials could be sometimes critical for production process e.g. catalysts of the process, additives to oils and fuels, which are used in small quantity, but processing of the raw materials without this additions is impossible. Therefore they should be choosen with a big care and special contract agreements are necessary as well different schedule of deliveries /they are supposed to be contracted in bigger quantity than Economic Order Quantity./ Factory supplies should be specified in documentation of the equipment as well the spare parts. Specification should be made on the basis of the properties and characteristics of the factory supplies /not only trade names of the product/ and local products should be checked and adapted during the preinvestment stage.
Spare parts has to be specified in the engineering documentation of the equipment and definite cost of the yearly supply should be estimated. For the easily tearing/wearing parts detailed drawings are to be prepared.
Special care is necessary in the preparation of the warehouses and storages.
Physical and economical constraints should be investigated.

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3/ Unit cost is to be established on the basis of price prognosis /or contract/.
The difference in imported and domestic materials cost is very important:

| Cost on the imported material | Cost on the domestic material |
|---|---|
| - CIF cost/price | - ex-work cost/price |
| - clearing charges | - land transportation |
| - import duties | - insurance |
| - custom duties | |
| - land transportation | |
| - VAT | |
| - insurance | |
| - port costs | |

---

4/ Special part of the inputs are utilities. They are intensive factors for the transformation of the raw materials to ready made products and in the most cases they do not participate physically in the prod duct. We can specify several kinds of utilities:

- technological fuel
- steam and other heat carriers
- technological water
- cooling water
- cooling air
- other cooling agents
- special utilities /air compressed, nitrogen etc./
- electric power

Technological fuel serves to heat furnaces where the endothermic process is carried out. There are several kinds of technological fuels: gas-methane, light fractions of the oil rafination, heavy diesel fraction, different kinds of fuel oil. The consumption is defined by the process, but for use of that kind of source of heat it is necessary to assure logistics of its supply. Gaseous fuels are supplied by pipes and depressurised in gas stations and sometimes purified from sulphur /corrosion of the furnace/. Liquid fuels are supposed to be delivered by road or railway transport.

On site it is necessary to provide reloading facilities and storages

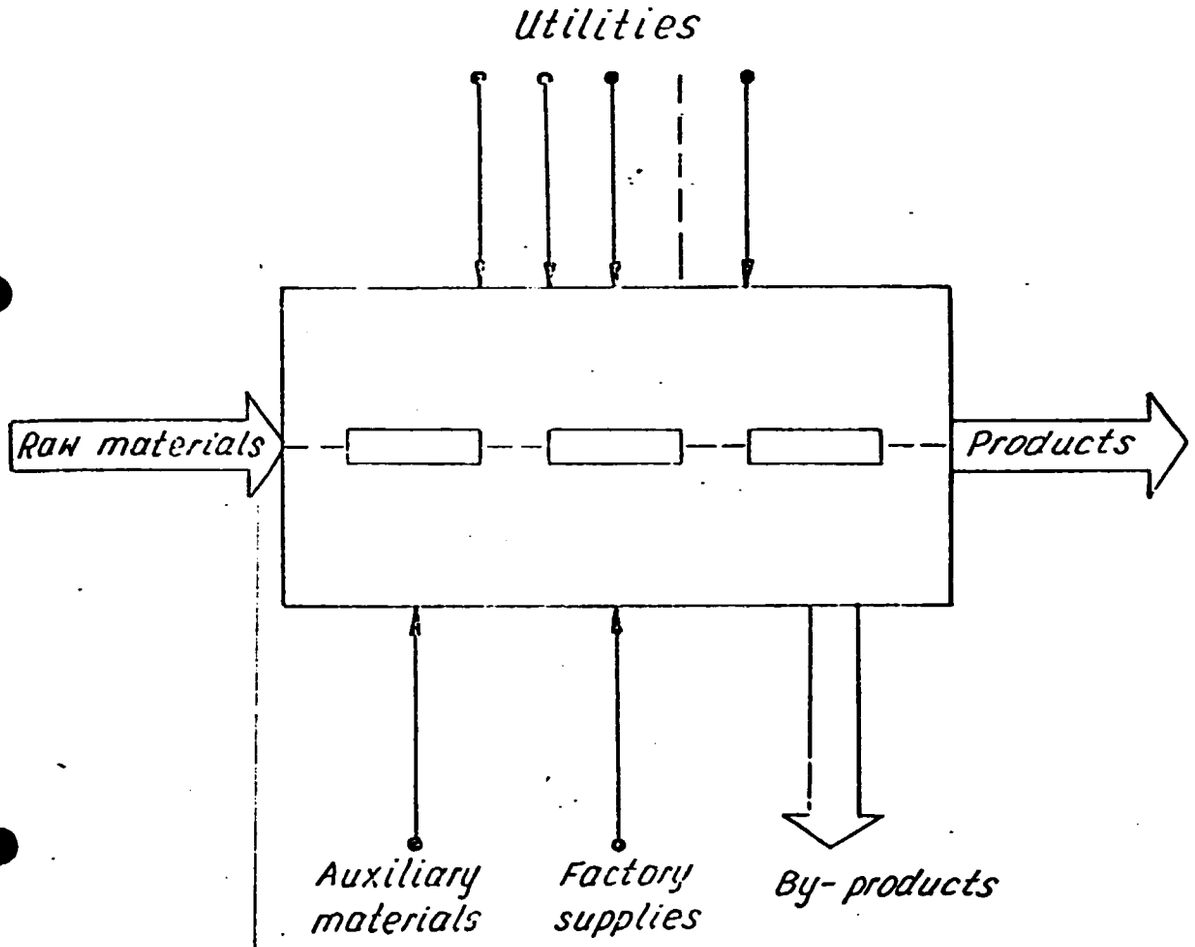
Steam or other heat carriers /like dowtherm/ are produced on the factory in boiler section. If the use of heat energy is high enough than one should built the power station where the part of the steam energy is used to produce electroenergy.
Investments in this case are higher, but at todays prices of the energy it is easy to prove that this kind of investment is economic.
The steam are produced at high pressure and after turbines we can have several levels of pressure /high pressure steams like 60-80 ata medium pressure steam like 20-30 ata and low pressure steam like 2-6 ata/.
Condensate after utilisation of the steam heat is recycled to power station.
Losses are covered by specially processed water.
Steam is very economic kind of heat carrier because it contains in 1 kg 540 kcal of the heat and also heat transfer coefficients are high is diminishing the size of heatexchangers. When temperatures of the process are higher than 250-300°C high boiling heat carrier are used. The typical example is dowtherm or other highly aromatic fractions from refineries. The dowtherm is heated in special furnace and than is used as heat carrier in the process. Equipment in this closed circuit is highly specialised.
Water is used for technological purposes or like cooling agent. Use of the water in the technological process requests it pre-preparatio Technology of the water preparation is rather standard and installat is composed from mechanical filters and anxionic and cationic filter Disstilled water is used in special cases, because of high energy consumption in this process.
As a cooling agent water is used also after some preparation, filtration and some demineralisation. If it is used in closed circuits /cooling towers/ than stations of biological treatment is necessary e.g. clorination of circulating water. Water as cooling agent in closed circuits can be used only at low or medium humidity and temperatures not higher than 40°C.
In some cases air can be used as a cooling agent. Several models of the air-coolers are widely used in the petrochemical and refinery industry. For special purposes other cooling agents can be used e.g. ammonia, freons when temperatures of the process should be kept from 0- -30°C and propane-ethane mixtures when temperatures below -70°C are requested. This kind of cooling agents is expensive and can be used in very sophisticated processes, when added value of the product is high.

To produce low temperature energy the primery electrical energy is used /mainly for compression of the gases/.
Compressed gases as air and nitrogen are used for mainly two purpose
- as technological agent or safety antyexplosion blankets /nitrog
- as energy cerrier in pneumatic systems of mechanisation or automation

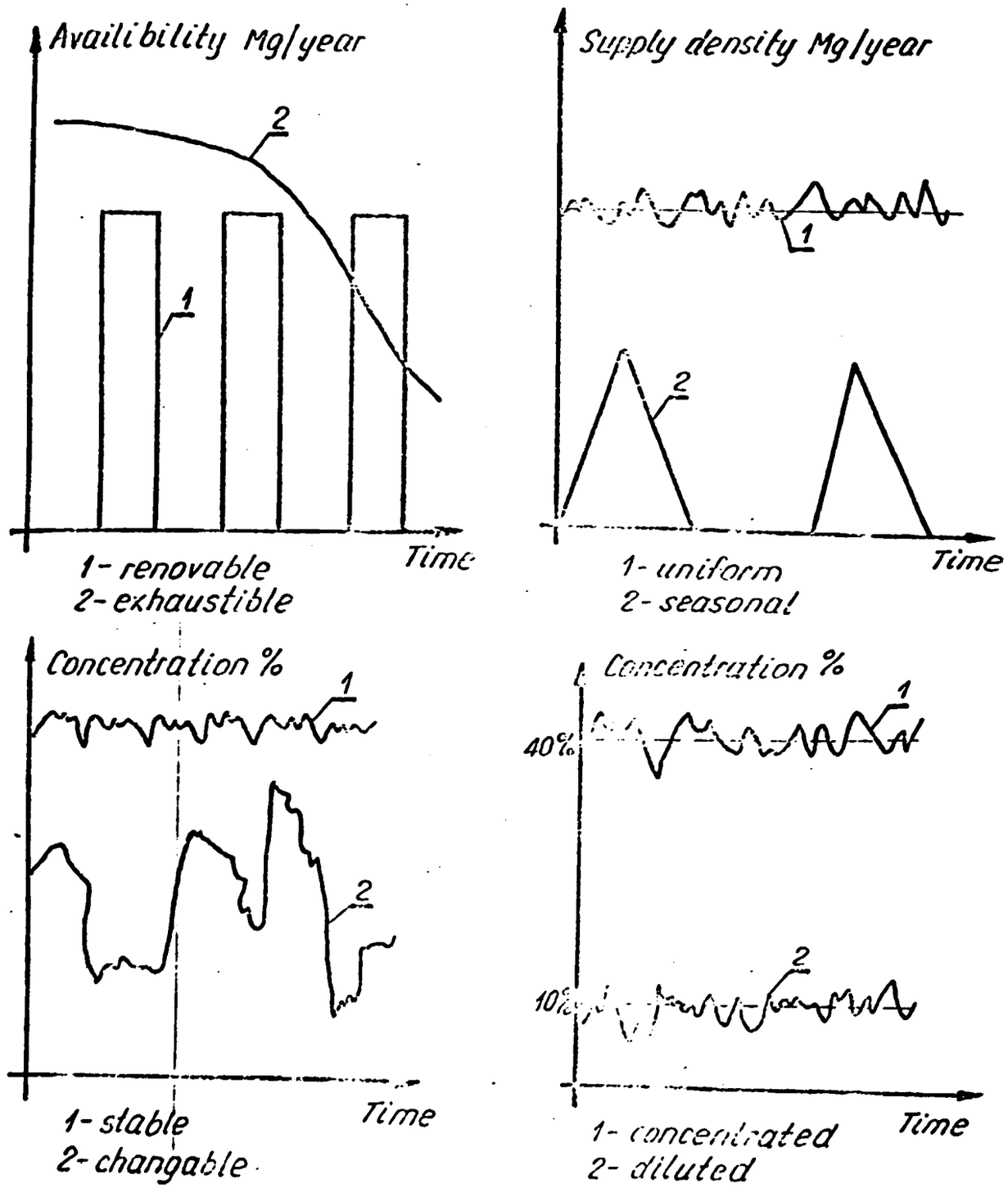
Gas stations are equipped with compressors, coolers, condesators or/and drying filters. Compressors can be driven or by electrical energy or by diesel motors. The specially universal energy carrier and over all used utility is electricity. It is source of lightning and power and as we have seen any of other utilities would be useless without the electric power.
There are several standard tensions at which electroenergy is used:

- for lightning 110 V, 220-250V /also for small motors/
- as power resource the 500-600V, and for the high power motors also 6000V tension is used.

Therefore the circuits of electrical energy are complicated at any factory. They should be equipped in transformer of tension, special blocade systems switchboards of different size and capacity, and control systems.
Installed power is measured in KVA which includes both the resistive and reactive energy. Power factor is the coefficient to calculate the resistive component of energy KW, which is the sum of power in KW of all motors in factory. Of course not all the motors installed are working simultanously and this is expressed by the coefficient of the load factor. From this informations we can calculate the power which should be connected to the factory. In some countries this figure is reason fo the taxation, independently if energy is used or not. Consumption of the energy depends on time factor. Therefore to estimate the bill of energy quantity of hours of motors exploitation should be defined and quantity of KWh calculated.

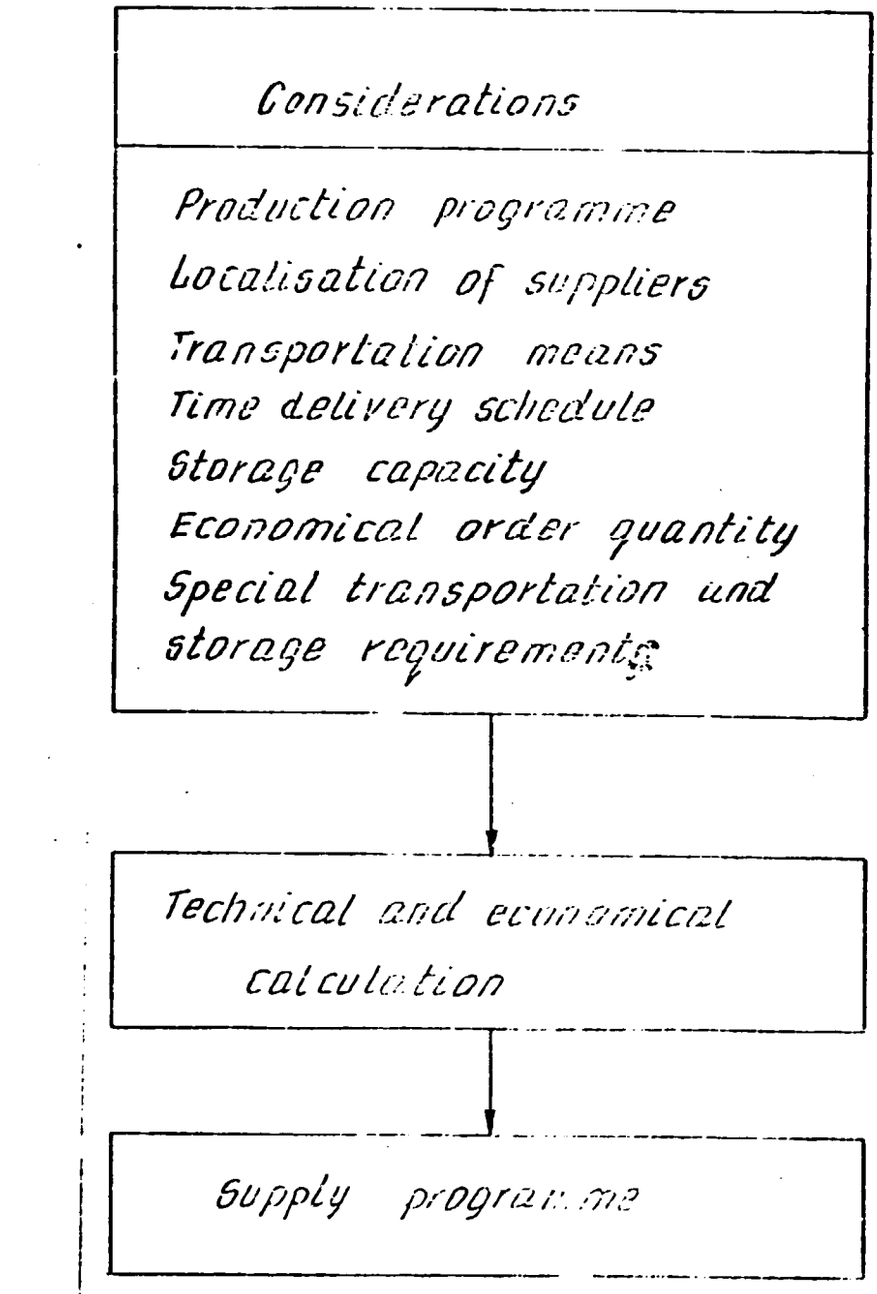



Model of materials and inputs transformations in the production process.




Time dependent properties of the raw materials

| | |
|---|---|
| Technical variables | Deposit reserves /status of definition/ |
| | Quantity already used |
| | Proportion of old users |
| | Quality / statistical/ |
| | Variability of output |
| | Yields of product |
| Logistic variables | Existing transportation facilites |
| | Monopoly of transport means |
| | Transportation impact on quality |
| | Storage at supplier |
| | Storage impact on quality |
| | Storage standards and methods |
| Economical variables | Cost determinants |
| | Seasonal opportunity cost |
| | Supplier monopoly positions |
| | Cost charges and surcharges |
| | Form of contract |
| | Suppliers organization |
| | User organization |
| | Joint - venture possibility |
| Availability | analysis of raw materials |




— Supply programme considerations

Training course UNIDO-CSPS

J.A.Kopytowski

Warsaw 19.10-12.12.1982

Exercise

Chapter V Materials and inputs supply

Determination of the materials and other utilities quantities for the acrylic resin suspension production process.

1. Key words: Acrylic resin suspension - water

suspension of solid copolymer /latex/ of the concentration 40% used in paint industry.

2. Technological recipe of process.

| Item | Units | Input per charge |
|---|---|---|
| BEAA | Kg | 1.000 |
| Styrene | Kg | 614 |
| AA | Kg | 100 |
| AN | Kg | 200 |
| Water | Kg | 3.000 |
| Emulsifier | Kg | 100 |
| Catalyst | Kg | 6 |
| Salts | Kg | 20 |

Copolymer yield 98%

Process is carried out in 7 $m^3$ reactor equiped with stirrer, heating cooling coil.

Process parameters:

Raw materials temperature 20°C
Temperature of process 70°C
Heat of reaction 330 kcal/kg
Latex temperature 20°C

Motor power: N = 12 KW

Time of the reaction: 5 h

Stripping nonomer under vacuum: 1 h

./.

Utilities consumption at stripping:

180 kg of 1.2 MPa steam and 24 $m^3$ cooling water of 16° C.

Loading, unloading, cleaning 2 h

3. Exercise

Calculate required quantities of the materials and utilities per 1 year of production. Insert the results into schednle 4-1/page 73/. Calculate the cost of materials and utilities.

Exercise N3

Price list

| Item | Units | Price |
|---|---|---|
| BEAA | M.u./Mg | 1.500 |
| Styrene | M.u./Mg | 1.000 |
| AA | M.u./Mg | 1.200 |
| AN | M.u./Mg | 1.000 |
| Demineralised water | M.u./$m^3$ | 150 |
| Emulsifier | Mu/kg | 10 |
| Catalyst | Mu/kg | 100 |
| Salts | Mu/kg | 5 |
| Cooling water | Mu/$m^3$ $10^3$ | 15 |
| Steam | Mu/Mg | 50 |
| Power | Mu/MWh | 77 |

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Chapter VI. Technology. Technology transfer.

Lecture content:

1. Technology definition. 1/
2. Technology classification 2/ and application conditions
3. Strategies of technology transfer
4. Degrees of technology acquisition
5. Results of different procedures of technology transfer
6. Model of the process adaptation
7. Special cases of trade-offs in the process adaptation.
8. What is to be licensed?
9. List of technology transfer documents
10. Expected risk reduction and profit expectations at different contract models.

Comments:

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1/ Every acticity is realized by special means. If we are repeating th same activity using the same means this can be called a method of activity execution. When methods are based on scientific results than methodology has been developed. Technology is the methodology to conditions of the input of the flow transformation to the requested product. Technological process transforms substances or their shape with the application of the physical, chemical and othe rules and laws in certain region of parameters and variables, using standard or specialized technical structure. The technical structur may by part of the technology in the cases when is specificaly attached to the transformation process. In most cases however the equipment and machinery serve as the environment to the technological process, and their particular source selection is secondary with aspect to technology.

Every technological process is characterised by its parameters like parameters like pressure, temperature, size, concentration, sequence of elementary actions etc., and the specific recipes or prescriptions are countless. But in every case action of those parameters can be integrated to the several intensive properties like consumption of the energy, consumption of the labor, consumption of the materials, and consumption of the capital /total fixed capital/.

---

2/ The classification of the technologies can be made by branches of industries, or by means used in the production process. But for decision maker this classification is useless. When the process of the selection of the technology starts than we should use classification of its applicability to the given project. From this point of view qualitative definitions are used:

- frontier technology
- advanced technology
- mature technology
- obsolete technology
- primitive technology

The frontier technology is such a process which brings not only the highest reward to the investement, but normally uses unique materials specially trained people, and needs very developed infrastructure in the inputs and specialized equipment.
Normally is exercised in one or very few countries. The examples are: space technology, aviation, electronics, special chemical products like low tonnage plastics, pharmaceuticals, pesticides,etc.

Advanced technology is less sophisticated and during the modernization of existing technologies is being permanently developed to meet the competition of the market. Realization is much more easy and universally available materials are used as well rather standard equipment. Only skill of the management and workers is high and permanent research is carried out and improvements, continuously are being introduced. The examples are: motor car industry, high tonnage plastics, shipbuilding industry, cosmetics and detergents etc.
The mature technology has been utilized in many places at different climatic and economical conditions in different sizes of output and be easily tailored to practically any request of the customer. Is using standard equipment and if special machinery is necessary it could be produced in many machineshops or factories over the world. The examples are: fertilizers, anorganic products, standard housing equipment, furniture, standard machinery and equipment, some petrochemicals etc.
Obsolet technology is the realisation of the old engineering concepts and in most cases is characterised by the low capacity, low yields of the final product, large quanitity of the effluents and many industrial hazards in plant operation. Mostly it uses manpower in extensive way in unacceptable conditions. The examples are: marten steel furnaces old machineshops, coke industry etc.

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3/ To make any choice of the technology we have to be equipped with some specific measurable parameters, which allow to compare different production processes and can assure at last to establish order of the priority of the different technological processes. As we have mentioned before there are four main properties of cast technology which are in the most cases substitute one to another. For every specific process it could be some trade off between the consumption of the materials, energy, labor and capital. Comparison between different proposals or self developed processes should be made taking into account real internal trade of between those properties of the process. Measure of trade off can be made or in monetary terms or in physical terms /e.g. materials versus energy/.

Exercise

## Chapter VII Technology selection

Comparison of the semicontinuous and continuous bleaching of fats and oils.

1/ Key words: Bleaching - sequence of unit operations removing some colouring impurities from fats or oils

Fats and oils - glyceride esters of fatty acids $C_{14}$- $C_{22}$ /mostly $C_{12}$- $C_{18}$/

Semicontinuous process - Limited time continuous flow of inputs and at last one of the output, followed by the nonproductive /service/ operation.

Continuous process - Permanent flow of inputs and outputs

2/ Technologies description

A - technology - semicontinuous bleaching of the almond / peanut/ oil

Fig. N1

The oil is pumped to kettle equiped with stirrer and heating coil and than bleaching earth /or activated carbon/ is added. After one hour of mixing oil with earth, suspension is pumped through filter press, from which pure oil is obtained. Bleaching earth is recovered from filter after termination of the operation.

B - technology - continuous bleaching of the almond oil.

Fig. N2

The oil and bleaching earth are continuously transfered to kettle equiped with stirrer and heating coil. Mixed suspension is pumped to rotary filter. Formed on the first vacumm section cake is washed with solvent and filtered on following sections. Dry cake is cut out from filter and transported to solids disposal. Solvent-oil mixture is pumped from separator to distillation unit.

Recovered oil is added to filtrate from first section of the filter and pure solvent is recycled to washing section of rotary filter.

3/ Process data for the alternatives at 100 MTPD capacity.

| Items consumed | Units | Process semicont. | cont. |
|---|---|---|---|
| Oil losses | Kg | 1.600 | 160 |
| Bleaching earth | Kg | 2.000 | 1.600 |
| Solvent losses | Kg | - | 300 |
| Steam | Kg | 9.000 | 19.000 |
| Power | KWh | 650 | 950 |
| Water | $m^3$ | 600 | 1.600 |
| Man-hours | h | 96 | 48 |

Price list of items is attached to the exercise.

4. Exercise

Compare the processes costs of the operation. Determine condition for equipment cost increment at which continuous process is an appriopriate technology. Semicontinuous process investment expenditures has benn evaluated and figure $0.5.10^8$ $\frac{M.u}{E/h}$ -- was accepted for the project. If the semicontinuous process was previously implement what possible solutions are to be investigated ?

Exercise N1

Price list

| Items | Units | Price |
|---|---|---|
| Oil | M.u/Mg | 1.800 |
| Bleaching earth | M.u/Mg | 800 |
| Solvent | M.u/Mg | 600 |
| Steam | M.u/Mg | 50 |
| Power | M.u/MWh | 77 |
| Water | M.u/$10^3 m^3$ | 15 |
| Manhour | M.u/h | 5 |

Exercise N1

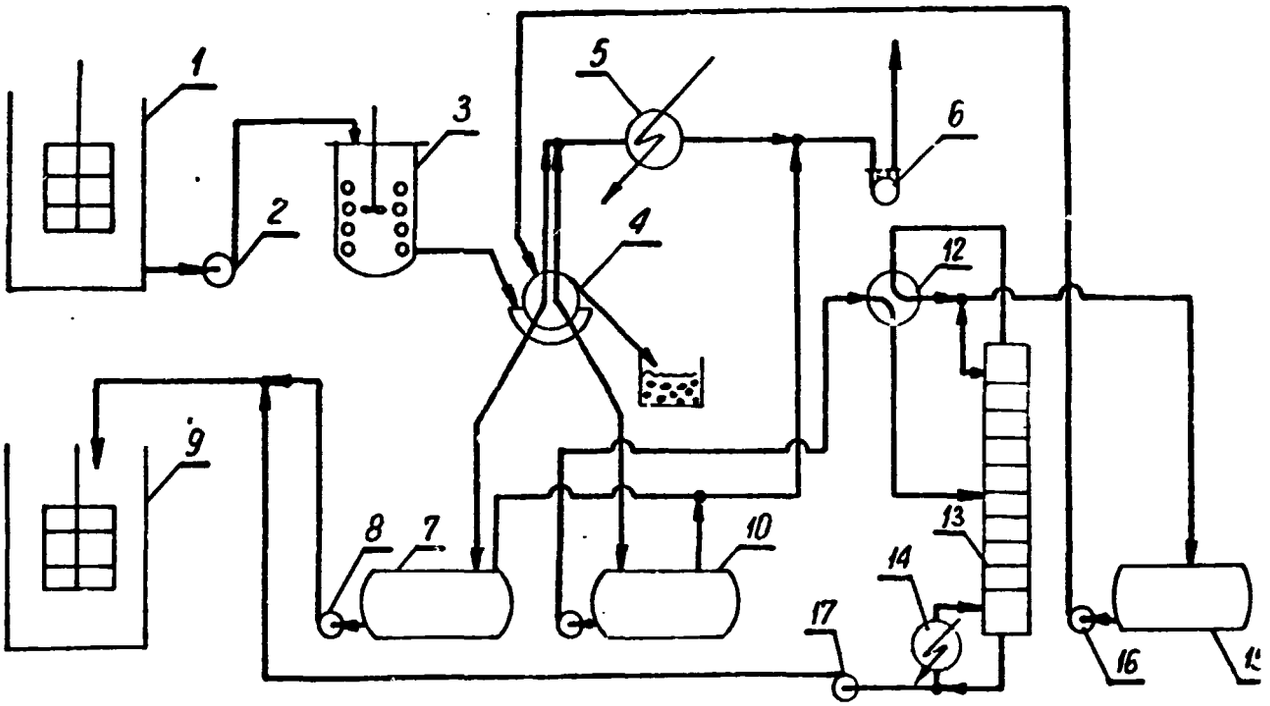


Fig N2. Flowsheet of continuous process.

Equipment list

| Item N | Specification |
|---|---|
| 1 | Tank |
| 2 | Pump |
| 3 | Kettle |
| 4 | Rotary filter |
| 5 | Cooler |
| 6 | Vacuum pump |
| 7 | Vessel |
| 8 | Pump. |
| 9 | Tank |
| 10 | Vessel |
| 11 | Pump |
| 12 | Heat exchanger |
| 13 | Distillation column |
| 14 | Heater |
| 15 | Vessel |
| 16 | Pump |
| 17 | Pump |

Exercise N 1

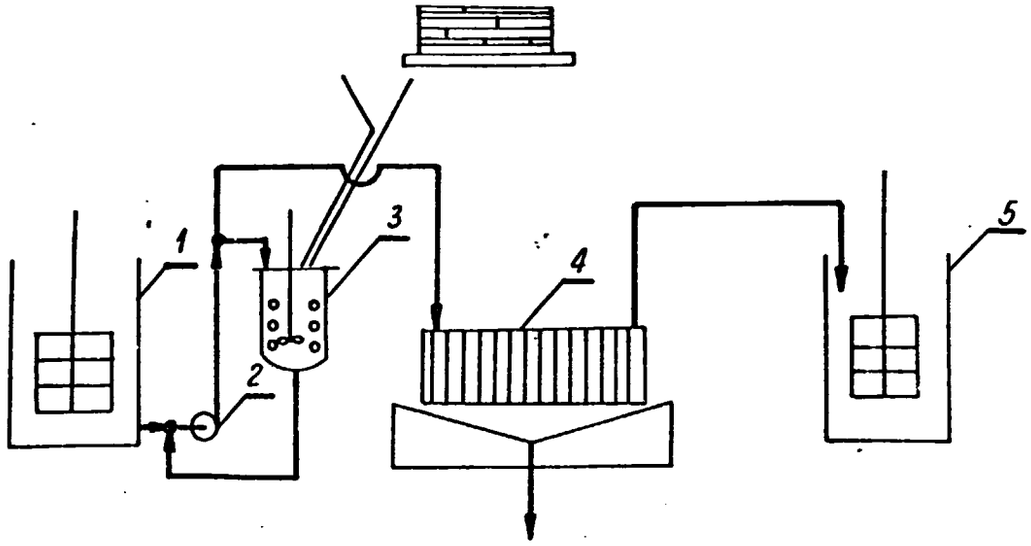


Fig N1. Flowsheet of semicontinuous process.

Equipment list

| Item N | Specification |
|---|---|
| 1 | Tank |
| 2 | Pump |
| 3 | Kettle |
| 4 | Filter press |
| 5 | Tank |

# Technology selection

| Considerations | Evaluat factor |
|---|---|
| - raw materials availibility, inventory cost | Q,E |
| - % of the foreign components and sources of acquisition/how many producers/ | E |
| - quality and shape compatibility of the product with internal requirments/measur | Q |
| - elasticity of the production programme | Q |
| - source of the technology and its supporting portfolio (patents, trade marks) | Q |
| - terms of licensing agreement | Q,E |
| - competitive cost of the technology (!) | E |
| - infrastructural compatibility | Q,E |
| - capability of the user to absorb and use technology | Q |
| - economical considerations/investment production costs, NPV, ROI/ | E |
| - local versus foreign alternatives | E |
| - technical considerations | Q |
| -- production schedule/elasticity/ | |
| -- dependence of the technology on critcal equipment | |
| -- lower upper limits of operational capacity | |
| -- pollution | |
| -- level of automation and mechanization | |

Q - qualitative appraisal E - economical appraisal

# Comparision of the qualitative parameters of technology

| Parameter | Weight factor % | Qualification of alternatives /points/ | | |
|---|---|---|---|---|
| | | I | II | III |
| A | 10 | 3 0.3 | 2 0.2 | 3 0.3 |
| B | 20 | 2 0.4 | 3 0.6 | 2 0.4 |
| C | 50 | 1 0.5 | 2 1.0 | 3 1.5 |
| D | 20 | 2 0.4 | 1 0.2 | 1.0 2 |
| | Total | 1.6 S | 2.0 C | 2.4 A |
| Case | | | | |
| elasticity | 15 | 3 0.45 | 1 0.15 | 2 0.3 |
| source of t-gy | 10 | 3 0.3 | 1 0.1 | 2 0.6 |
| capability of absorbtion | 25 | 3 0.75 | 2 .05 | 2 0.5 |
| dependance on c.e | 35 | 3 1.05 | 1 0.35 | 3 1.05 |
| pollution | 10 | 3 0.3 | 1 0.1 | 2 0.2 |
| level of aut. and meth. | 5 | 1 0.05 | 3 0.15 | 2 0.1 |
| | | 2.9 | 1.35 | 2.35 |

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Chapter IX. Project engineering.

Lecture content:

1. Production planing objectives
2. Process design. Functional chain of unit operations.
3. Function and structure compatibility for unit operatic
4. Process and Instrumentation flow-sheet of unit operati
5. Parametrisation of process flow
6. Hierarchy of technical and economical parameters and variables describing the porduction process
7. System analysis of the technical structure of the production process.
8. Procedure of the equipment selection.
9. Investment cost estimate.
10. Preliminary project /project charts and layouts/[1]

Comments:

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1/ Once technology has been selected or at last alternative solutions are known it is necessary to define the main and auxiliary equipment. Sometimes it is very easy task because equipment used in the process is standard. This is the case for most machineshops. When specialized equipment is to be used : detail preliminary design it is necessary. In some cases technology and equipment are so interdependent that selection of the technology automatically define the equipment.

What is necessary to specify equipment or to prepare order for bids?

- Material and energy balance of the technological proces

While the production programme is defined plant capacity preliminary estimated, materials and inputs calculated and technology selected, balance of the flows through the different process units is a problem with which every process engineer can deal. Parctically balance preparation is solution of the several to several hundreds of equations including process parameters and flow properties.

- preliminary flowsheets of the technological process should be prepared.

2/-

Some information is given in the basic engineering or in bids of the technology supplier. Using the data from material and energy balance and process information Process and Instrumentation /P I/ charts should be prepared.
Than we will have the complex look on all interconnections between the unit process equipment and all additional points of the flows will be identified. Indications on the instrumentation and control points are tc be discussed because at this moment the manpoweer is decided in quantity and skill.

- balancing of the equipment capacities

Identification of each unit process on the P I diagram and material balance are giving the possibility to calculate the each process unit capacity. Calculations are made on the basis of the engineering manuals or on the basis of the informations from the catalogues or specification lists of the equipment producers. Chcose of the equipment is to be made keeping the proper capacity proportions between the all items of the production process.
Selected equipment has to be specified on special check lists which are source for further calculation of the equipment cost. The typical check list is given in the MANUAL /p. 119 English edition/.
Procedure of the purchasing of the equipment and its cost estimate on the basis of the data in the offers or quotations of the producers will be discussed later.
Process functional charts.

Technological process defined on the P I diagram and dimensions of the every piece of the equipment given in the specifications, allow to prepare layouts of the equipment in the three dimensional space. This plant layout must follow several rules:

- location of the equipment is to be concise with the material flow,
- place for transport routes, local storages of processed materials, control and instrumentation rooms and necessary rest tooms for the workers has to be provided
- proper proportion between the working surface and many-level flooring is to be kept /cost of the land energy is to be considered/

General functional layouts.

All the equipment and machinery are to be placed in production areas which could be buildings or open air structures. Division of the process into several bloc depends mostly on the process requirements and organisation and management system in the factory. Sometimes the physical constraints are the obstacles to put all the equipment into one building.
All the auciliary buildings and structures are to be defined and properly placed on the site. All kinds of the buildings are to be considered:

- factory production buildings and structures
- anciliary buildings /maintenance machineshops, garages, research and control laboratories, medical service building factory, restaurants etc./
- stores and warehouses /raw materials, auxiliary materials, finished products/
- welfare buildings
- administrative buildings
- hostels and eventual residential buildings

Transport layouts.

All the transport routes of the materials and products has to be investigated and proper roads, tunnels, bridges, railroad and truck loading stations designed with the connection to existing public facilities.

Utility layouts and diagrams.

Machinery and equipment specification show the necessary quality and quantity of the utilities. Then the total consumption and supply as well as distribution points can be drawn. This source of information serves to design the all lines of distribution of the utilities, as well allows the dimensioning of pipes, cables and structures.

Telecommunication layouts.

Every process demands the central control and collection of the information as well the interprocess communication. Therefore layouts for the telephone wiring and distribution are necessary.

4/-

Sometimes two parallal telephone systems should exists /internal to supervise process and external to communicate with the factory administration/. Computer centres, printing and reporduction facilities as well as the telex contre should be designed.

Manpower and staffing of the factory.

Charts of manpower requirement and skill description with indications to training programme, and staff estimation is to be prepared. Methods of manpower estimation will be discussed later.

Organisational layouts.

Organigrams showing the organizational set up for the operation of the factory are to be prepared. This should be supported by the regulations and obligations as well responsibility prescriptions. Because organization of the operating factory is different also the organization during the engineering and erection time is to be proposed as well during the start up period. From every layout the necessary equipment and materials should be defined and specification charts should be prepared. This would serve to establish or control the cost of the civil works and will allow to place orders at the proper time.

Civil engineering works.

Already collected information allows the analysis of the civil engineering works which are necessary for the factory erection. Additional data are collected from the localisation and site description.

Three kinds of civil engineering works are to be estimated:

- site preparation and development
  The volume on check list is given in the manual /P. 120/

Calculation of the cost is made on the estimation basis of the physical volume of each kind of jobs, and prices dominating in the country or region. The tenders from the contractors should be sought giving them site data and appropriate layouts and charts.

- buildings and civil works.
  The check list is given in the manual /P.120/

The procedure of the volume and cost estimate as above is to be applied

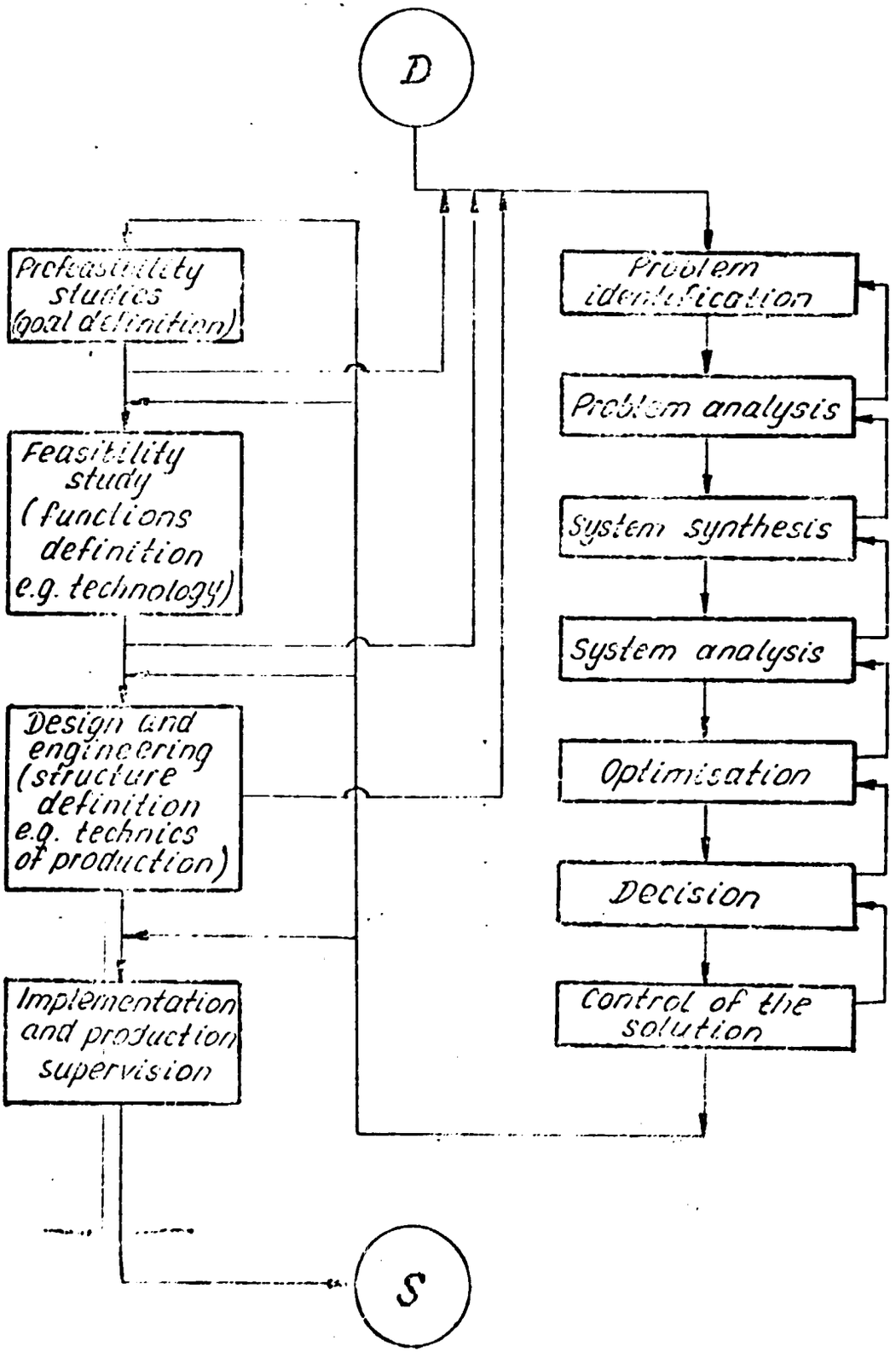
- outdoor civil works
  The check list is given in the manual /P. 121/

The procedure of the volume and cost estimate as above is to be applied.

5/-

# Engineering design objectives.

- to define parameters and variables of the process
- to define dimensions, sizes, weights of machinery and equipments
- to define span allowances of structural elements
- to define volume, stability of civil works
- to define interconnections units and with environments
- to define inputs consumptions
- to define investment cost, production cost




Procedure and stages of project development.

Training course UNIDO-CSFS

Warsaw 18.10-12.12.1982.

J.A. Kopytowski

Chapter X Manpower.Training.

Lecture content:

1. Estimation of working time a/per year b/ per shift
2. Estimation of working places quantity 1/
3. Coordination of the operation time and working time
4. Indirect labour 2/
5. Working schedules
6. Wages-skill categories of workers. Salaries scheme. 3
7. Organization chart of the installation, plant, compa General principles.
8. Staff and managerial forces
9. Cost estimate of labour.
10. Training programme 4/

Comments:

---

1/ Estimation of the quantity of the labor and their skill should be a result of the production process analysis. Direct applica tion of information concerning the manning the process from ot countries is leading to erroneous decisions, because of differ organization of the industry as a whole /e.g. service system/. Some help in the labor estimation could be:

- equipment supplies
- output data from other factories in the country

The best solution for the labor estimate is the analysis of th working places. To the working place is attached permanent function fullfiled by the operation on the place, or in the several places, covering his scheduled time of work. On the wo ing place operator is in the contact directly or indirectly wi the flow of the materials and the machinery or equipment.
It means that only analysing the P I diagram and layouts of th equipment one can define the quantity and quality of the labor The procedure of the estimation is as follows:

- define the places on the P I diagram where the partic pation of the worker is anticipated
- estimate the time necessary to service the equipment or flow of the materials
- add auxiliary activities

- count the quantity of the labor on the every working pla
- add the control operation and time
- estimate direct supervisory manning
- add the personnel in control rooms or at steering panels
- define the capabilities and knowledge to service each working place

Result should be the direct labor specification in the given section or departament of the factory.
In some factories above the direct working place attached personne it is necessary to follow periodically the performance of the some specialised machinery which is selfcontrolled, but needs some supervision on the mechanical side /like compressors, pumps, hydra ulic pressure facilities/. Than the route of the controlled places is to be established and routine circulation personnel is to be assessed. This personnel may to be obliged to execute simple maintenance like greasing, liquidation of the small leakages etc. It i necessary to establish control timers for this personnel, or other way of reporting.

---

2/ Additionally to the direct production personnel is to be defined on the basis of the functions of each service section:

- store and warehouses personnel /on the basis of time schedule of the activity/
- maintenance machinshops personnel and specialized maintenance personnel
- water, electricity, effluences and other utilities servi personnel
- automation and instrumentation section personnel

Quantity and skill has to be defined on the basis of layouts and diagrams of the utility distribution and the procedings of the timing.

---

3/ Salaries are to be established in two models:

- monthly salary for the clerical, managerial, and supervisory personnel
- hourly pay for the most of the workers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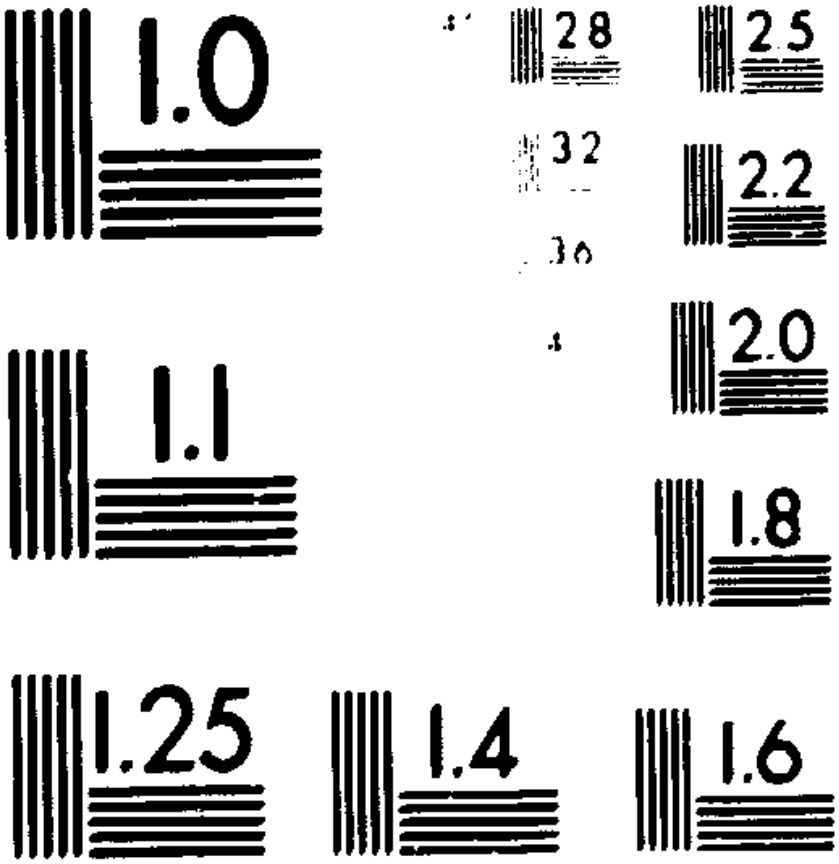


To establish hourly pay the basic working time in the month should be established as well as the principles to recompensation for overtime, leaves and proved illness. The classification of the hqurly pay against the skill group shall be defined as well conditions of the promotion.

Training programme should be differentited in time schedules and methods of the training. Classification of the training programmes can be proposed as follows:

- training of the maintenance personnel, tool making personnel, and utilities service and instrumentation service personnel

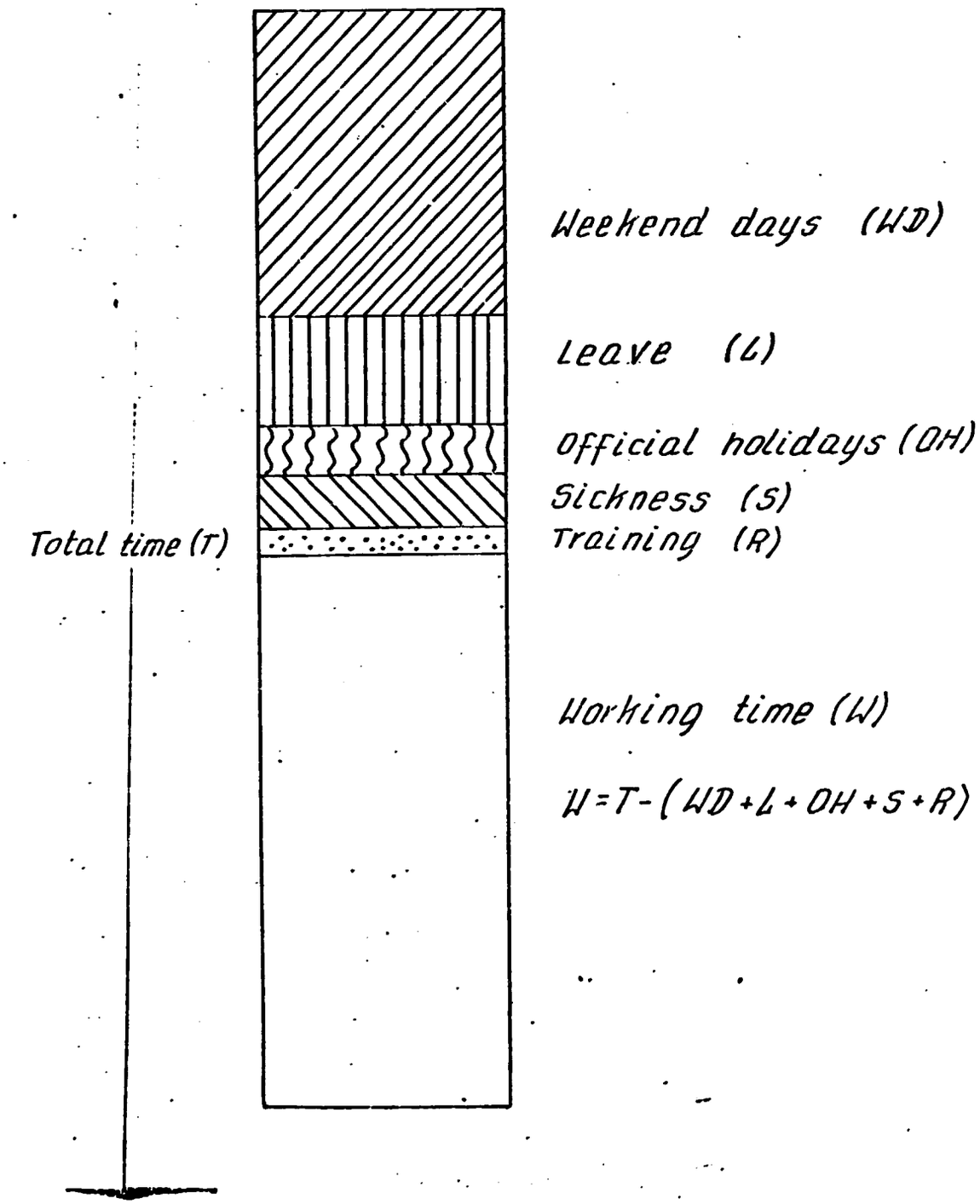
This personnel should be selected from local schools or unemployed educated population. At first the local training theoretical course should be organized with the help of the local and foreing specialist. Afterwards when contracts with suppliers will be concluded, the necessary quantity should be trained outside the country with the legal obligation to start designed job or to return expenditures on their training. Before the start up and during the operation period they should be trained additionally by the supervising personnel from producers of the equipment and instrumentation. Salary of the this group of people should be possible highest to avoid transfer to other employers.

- direct process labor and direct supervisors training

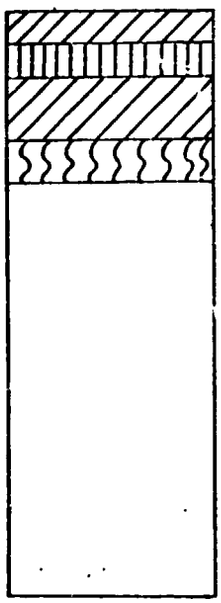
Source of the people should be as above. Employment of this people should start about half a year befote the erection is finished. During this time school classes should be organized where local and foreign specialists should at last during 3-4 months teach people theoratically and practically on the installation. Part of the supervisory manning should be trained abroad 3-6 months. Before the start up some training on "dry" equipment should be allowed or with the use of "dummy" raw materials.

- management and departament supervisory personnel training

If the country is practisising the delegation of high school educated people to the foreign universities this kind of people will fit to the managerial and technical supervisory activity in new factories. Local experienced managers should be considered as a top people for the factory direction.Training of the managerial personnel should last at least 6-12 month in the company where technology was aquired. Employment of the foreign personnel is also possible but only condition is that they will have specified functions, activities and responsibility e.g. technical manager, production manager, supervisory




Yearly balance of working time



Meal time (M)
Natural breaks (N)
Unproductive movements (U)
Interoperational rest (I)
Productive time (P)

Total shift time (T)

$$P = T - (M + N + U + I)$$

Coefficient of labour time utilisation

$$C = \frac{P}{T}$$

Shift balance of working time

TRAINING COURSE F.A.I - N.I.D.B. - UNIDO
LAGOS. 9TH SEPTEMBER, - 30TH OCTOBER, 1972.
NIGERIA.

J.A. Kopytowski

Chapter XII. Project implementation.

Lecture content:

1. Definitions. Implementation. Erection. Construction[1/]
2. Mapping the goals of different organizations at implementation stage.
3. Master schedule of the factory erection.[2/]
4. Contractual forms of the project implementation.
5. Investor's organization.[3/]
6. Control methods of the project implementation.[4/]
7. Scheduling methods.[5/] Delays.[6/] Cost of the project implementation.

Comments:

1/ Implementation is a period of time of the project development, which starts after decision of the investment and ends after guarantee test run and take over protocols has been signed. During the implementation of the project materials as well information is processed. Erection is a period of time when materials are processed. Construction is a period of civil works execution time. Some times these words are used as synonyms.

2/ General schedule and timing programme of the preconstruction, construction and commissioning series is to be carefully prepared. The standard activities to be mentioned in this chart are as follows:

- invitations to tender for equipment
- invitations to tender for civil works
- financing arrangements
- engineering /detailed/
- civil works engineering /detailed/
- purchasing orders
- civil works contracts
- land purchase contracts
- erection of the factory

- preparatory civil works
- roads, railways, main system of the piping /water, ifflunets/ and main cables distribution set
- main foundations
- buildings and structures
- equipment arrangement /piping, wiring, instrumentation/
- other specialised civil works /electricity wiring, water and steam piping, ventilation and climatization etc
- other accepted works and supplies
- commissioning of the factory
- commissioning of sections, departements
- commissioning of the utility supply system
- training of the personnel
- start up of the factory
- final acceptance of the works and sercices

---

All this activities are interdependent and are carried out in many cases parallely one to another.

---

3/ It is easy to observe that such complicated task needs special organization.

Investor is obliged to built up special organization to carry out all this activities. There are two possibilities of controlling of project implementation:

- contractually
- administratively

In the first case investor is concluding a contract with specialized company /local or foreign/ to organize all construction and commissioning. In the second case investor is employing group of the specialists and supervice their activity during the implementation of the project.

The standard composition of this organization is as follows:

- purchasing department /supplies manager, chief buyer, chief stores officer, purchase analyst, commodity buyers, stock controller stores accountant, storekeepers/

- civil works contracting department /chief engineer, chief buyer order analyst, civil works clerks, chief store keeper, storekeepers/
- supervising department /chief engineer, supervisors and inspectors, chief accounting officer, accounting clerks, report analysts, commissioning chief, commissioning officers and clerks/

All this organization is supervised by the investment manager service which is fully responsible before the investors authorities.

---

4/ The short description of the implementation of the project shows that this kind of activity is also complicated production process.

It means that it should be carefuly planned and controlled all the time. Several contracting companies developed sophisticated computer systems for this purpose. No doubt that for complex investment programme such a planning system is desirable. But without loosing much from its effectivity it could be substituted by the manual control system, which is slightly more labour consuming but can be followed by the people with less experience and education.
In addition to the organization of the implementation management system the simple planning and control system may by used. The following charts and schedules should be prepared to plan and control properly medium size project:

- Planning charts and schedules:
- master schedule
- critical paths diagram
- responsibility schedule
- schedule of machinery and equipment requirements
- manpower requirement schedule and chart
- basic materials and erection equipment schedule
- basic financing schedule
- Control charts and schedules
- summary construction progress report /by activities and costs/

- engineering construction critical activities list and alert list
- scheduling plot curves for labour consumption, equipment deliveries, materials consumption, and financial expenditures.

---

5/ Scheduling methods.

During the analysis of the implementation of the project many times the problem of the time schedule has been discussed. There are many methods of time and resource scheduling but two seems to be enough simple to be useful for the user.

- bar charts

Bar charts are simple construction of two informations; sequence of the activities is given on one axe, and duration of each activity is given on the other axe. Over the duration draw the quantity of necessary resources can be indicated. Bar charts are useful when the number of the activities is not very high /one page specification/. When the specification becomes numerous than usefulness of the method is limited.

- arrow diagrams

Arrow diagrams has been developed to resolve more complicated specification of the activities. Preliminary it was the method of the Critical Path Method which further has been translated to PERT methodology and with application to resource evaluation on optimization switched to RAMPS and other similar technics. There are several definitions which are necessary to be used for comprehensive utilisation of the CPM:

- activity is a task necessary to the completion of a given process /e.g. project implementation/
- event is the start or termination of the acticity
- earliest start /ES/ is the earliest time at which an event can take place so that all succeding activities can be completed on or before the project completion date
- latest completion is the latest time at which an event can take place so that all succeding activities can be completed on the project completion date

- duration is the time to complete an activity
- lag or free float is a difference between the allowed time of activity which is not changing the completion of the other activities and project completion and duration time of the activity.

The application rules of the method are very simple. Arrow indicates duration of the activity and its direction. Circles between arrows indicate events. Inside circles there is a number of the event and two figures indicating earliest start and latest completion. Each acticity is represented by one and only one arrow, and two activities can not be connected to the same head and tail events. If this is the case additional pseudo-event must be added with activity of zero duration.

To establish the duration time statistical data can be used or engineering calculations. To keep the duration time as objective as possible there is some distribution of duration expressed in optimistic, pessimistic and most likely time:

$$\text{duration time} = \frac{\text{optimistic time} + \text{pessimistic time} + 4 \text{ likely time}}{6}$$

Some of the activities are lying on the so called critical path /what means that they can not be delayed/. Critical path criteria are as follows:

$$1/ \quad ES_i = LC_i$$

$$ES_j = LC_j$$

$$2/ \quad ES_j - EC_i = LC_j - LC_i = D_{ij}$$

In given before procedure of the planning and control of the implementation process we have been using the both techniques of supervision. All the master schedules and general timing relations are presented on the bar charts, detailed timing schedules are given in the one of the arrows methods depending what kind of the computation techniques can be used. Every computer is supplied with the standard program of the planning in one of the CPM methods and task of the planner is only to define the sequence of the events and give the duration time of the activity. Rest of the calculation is done by the computer. Results are ES and LS, localisation on the critical path, or lag time of the activity.

---

6/ Independently how good organization of the project is, one can expect delays which are very difficult to be quantitavely estimate. Therefore when preparing the time schedule some contingencies periods should be foreseen. The major obstacles of the project proper implementation are as follows:

- rights to purchase the land
- late delivery of critical equipment
- delivery of the equipment not to specifications
- harbour congestions
- lack of the proper transport facilities
- lack of the proper local building materials
- mistakes or errors and ommisions in documentation
- mistakes or errors in geodesic data
- low quality of civil works
- lack of the labour or labour disputes
- bureaucratic procedures of equipment clearance
- technological errors

**ANNEX 9:** Teaching Materials and Outlines for Slides,
Module IV: Financial Analysis

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept - 14 Oct 1983
Materials used by
Mark Weber

# T E A C H I N G
# M A T E R I A L S
# A N D
# O U T L I N E S
# F O R
# S L I D E S

PROJECT ACCOUNTING PROCEDURES

Refer Section: 1
Module: IV

# B A S I C  P R O J E C T
# C O N C E P T S

## ' P R O J E C T  L I F E '

NEEDED FOR 'DISCOUNTING' CONCEPT

USUALLY BETWEEN 15 AND 25 YEARS PERIOD

A 'SALVAGE VALUE' CAN BE USED TO REFLECT ASSET VALUE/EARNINGS VALUE AFTER PROJECT LIFE PERIOD — COULD BE 'DISCOUNTED VALUE' INTO THE FUTURE OF EARNINGS STREAM

NOTE : : AT LOW DISCOUNT RATES — VALUE OF FUTURE YEARS PAST FIRST 15 COULD BE MEANINGFUL

AT HIGH DISCOUNT RATES — VALUE OF ADDITIONAL YEARS EARNINGS AFTER FIRST 10 COULD BE NEGLIGIABLE

## ' M A C H I N E  OR  P L A N T  L I F E '

A CONCEPT BASED ON THE NEED TO REPLACE OPERATING EQUIPMENT OR PLANT USED WITH REGARD TO DEPRECIATION

DEPRECIATION S H E L T E R S CAPITAL REPLACEMENT FROM TAXATION UNDER UNIDO SYSTEM; A FINANCIAL COST AND INCLUDED IN THE CALCULATION OF 'P R O D U C T I O N  C O S T' FROM OPERATING COST

IMPORTANT FOR GENERATION OF C A S H TO REPAY LOAN P R I N C I P A L BECAUSE IT IS NOT I N D E X E D TO I N F L A T I O N , CAN BE USED TO REPAY BORROWED INVESTMENT CAPITAL, BUT OFTEN N O T SUFFICIENT FOR THE NECESSARY RE-INVESTMENT NECESSARY WHEN EQUIPMENT WEARS OUT'

## ' I N T E R E S T '

A COMPENSATION TO THE LENDER FOR THE 'R E N T A L' OR HIS MONEY

USUALLY COMPOSED OF THREE ELEMENTS :

B A S I C  R E N T A L  V A L U E  O F  C A P I T A L

K E E P I N G  U P  W I T H  I N F L A T I O N
( DEPRECIATION OF MONEY IN AN INFLATING ECONOMY)

R I S K : PROBLIBILITY OF N O T BEING REPAID

Mktg & Fin. Analysis
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5 Sept - 14 Oct 1983
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# T E A C H I N G
# M A T E R I A L S
# A N D
# O U T L I N E S
# F O R
# S L I D E S

DEBT REPAYMENT SCHEDULES

Refer Section: 4
Module: IV

# LOANS

## TERMS:

DURATION (Period before Complete Repayment)

RATE OF INTEREST:

RATE AND METHOD OF REPAYMENT:

MORATORIUMS OR 'GRACE' PERIODS
ON PRINCIPAL REPAYMENTS
SOMETIMES ON INTEREST PAYMENTS TOO

OTHER CHARGES:
INVESTIGATION FEES
COMMITMENT FEES
ADMINISTRATION FEES
COSTS / COLLATERALIZATION
BONDING etc.

## TYPES OF REPAYMENT SCHEMES:

'ANNUITY' OR EQUAL PAYMENT
(PAYMENTS ARE EQUALIZED TO INCLUDE INTEREST - ANNUAL / MONTHLY)

EQUAL PRINCIPAL AMORTIZATION
(PAYMENTS ON PRINCIPAL ARE EQUALIZED; THEREFORE INTEREST
PAYMENTS ON BALANCE OUTSTANDING START HIGH, GRADUALLY REDUCE)

BALLOON LOANS -
(PRINCIPAL, AND SOMETIMES SOME OF THE INTEREST IS ACCUMULATED;
ALL IS DUE AT THE END OF THE TERM WHEN THE LOAN MATURES)

'FRONT-END LOADED' VERSUS 'BACK-END' LAODED WITH REGARD TO
THE EXPECTATION OF EARNINGS - THE GOMPERTZ CURVE AT START-UP

## DIFFERENCES IN INTEREST CALCULATION:

SIMPLE INTEREST
COMPOUND INTEREST
DISCOUNTED INTEREST - PAID AT THE BEGINNING
EFFECTIVE RATE ??

# L O A N S (2)

N.O T E: TYPES OF L O A N R E P A Y M E N T S C H E M E S FITTED TO N E E D S OF CLIENT // OR N E E D S OF LENDER :

C O N S T R U C T I O N L O A N S : DRAW-DOWNS
CERTIFICAT OF COMPLETIONS
QUANTITY SURVEYS/SERVEYORS etc.

L E A S E WITH O P T I O N TO P U R C H A S E

D E C L I N I N G V A L U E OF ASSETS MUST BE TAKEN INTO ACCOUNT- Examples

I N C R E A S I N G V A L U E OF ASSETS MAY BE TAKEN INTO ACCOUNT - Examples

C O L L A T E R A L I Z A T I O N / TYPES of COLLATERAL ACCEPTABLE

S H O R T - T E R M VERSUS L O N G T E R M

W O R K I N G CAA P I T A L L O A N S : F A C T O R I N G OF ACCOUNTS RECEIVABLE COLLECTIONS
B O N D I N G OF INVENTORIES

I M P O R T A N C E OF C R E D I T W O R T H I N E S S OF B O R R O W E R :

B U S I N E S S R E P U T A T I O N :

P R E V I O U S C R E D I T H I S T O R Y : LOANS REPAID/OUTSTANDING DEBT

N E T W O R T H : OTHER PLEDGES/ CONTINGENCIES

B A S I C R U L E S U N D E R L Y I N G P R O J E C T L E N D I N G :

E A R N I N G S P O T E N T I A L OVER A S S E T V A L U E

A L L T E R M S O F L O A N M U S T B E L E G A L : UNDER CODE OF LAW

(BASIC TENENT OF CONTRACTUAL LAW IS THAT THE PROMISE MUST BE LEGAL)

Mktg & Fin. Analysis
Lagos, Nigeria Course
5 Sept - 14 Oct 1983

Materials used by
Mark Weber

# T E A C H I N G
# M A T E R I A L S
# A N D
# O U T L I N E S
# F O R
# S L I D E S

RATIO ANALYSIS:

Refer Section: 8
Module: IV

# FINANCIAL RATIOS

## OTHER RATIOS USED:

## PROFITABILITY RATIOS:

### 'GROSS' PROFIT MARGIN :

I. $\frac{\text{SALES}}{\text{COST OF GOODS SOLD=('Operating Cost')}}$

II. $\frac{\text{SALES}}{\text{PROFIT B/TAX}}$ (as a ratio); $\frac{\text{PROFIT B/TAX}}{\text{SALES}}$ (as a %)

'NET' III. $\frac{\text{SALES}}{\text{PROFIT A/TAX}}$ (as a ratio); $\frac{\text{PROFIT A/TAX}}{\text{SALES}}$ (as a %)

### RATE OF RETURN = ROR (%) :

I. $\frac{\text{NET PROFIT}}{\text{TOTAL INVESTMENT}}$ = (Profit A/TAX)

II. $\frac{\text{NET PROFIT}}{\text{NET WORTH}}$ = (Shareholder's Equity including 'Retained Earnings')

III. $\frac{\text{NET PROFIT}}{\text{PAID-IN CAPITAL}}$ = (Equity Purchased)

### TURNOVER :

I. $\frac{\text{SALES}}{\text{TOTAL ASSETS}}$

II. $\frac{\text{SALES}}{\text{FIXED ASSETS}}$ = (Investment excluding WORKING CAPITAL Requirement)

### INVESTMENT RATIOS :

I. $\frac{\text{TOTAL INVESTMENT - WORKING CAPITAL}}{\text{ANNUAL PRODUCTION AT CAPACITY}}$ = (Money) = (Units)

II. $\frac{\text{PROFIT B/TAX and INTEREST}}{\text{ANNUAL PRODUCTION AT CAPACITY}}$ = (Money) = (Units)

## FINANCIAL RATIOS (?)

LOAN 'LEVERAGE' RATIOS :

I. $\frac{\text{TOTAL LIABILITIES AND NET WORTH}}{\text{EQUITY}}$ = (as a ratio)

$\frac{\text{EQUITY}}{\text{TOTAL LIABILITIES AND NET WORTH}}$ = (as a %)

II. $\frac{\text{TOTAL DEBT}}{\text{EQUITY}}$ = (as a ratio)

$\frac{\text{EQUITY}}{\text{TOTAL DEBT}}$ = (as a %)

III. $\frac{\text{LONG-TERM DEBT}}{\text{EQUITY}}$ = (as a ratio)

$\frac{\text{EQUITY}}{\text{LONG-TERM DEBT}}$ = (as a %)

INTEREST 'COVERAGE' RATIOS : (Debt Service Coverage)

I. $\frac{\text{NET INCOME + DEPRECIATION, TAXES, INTEREST}}{\text{LONG-TERM DEBT INTEREST REQUIREMENT}}$ (summed over year that Debt is out

II. $\frac{\text{NET CASH FLOW (Includes Depreciation)}}{\text{LONG-TERM DEBT REQUIREMENT FOR INTEREST and PRINCIPAL PAYMENTS}}$

DEFENSIVE ABILITY RATIO : = Ability to MEET MOST PRESSING OBLIGATIONS on a DAILY BASIS

I. $\frac{\text{CASH + RECEIVABLES}}{\text{'OPERATING COSTS' ÷ by 'Operating' Days *}}$

(Note : also sometimes used with annual days/365 but this overstates defensive abilities)

ASSET REPLACEMENT LIFE : (years)

I. $\frac{\text{TOTAL FIXED ASSETS}}{\text{AVERAGE ANNUAL DEPRECIATION}}$

## FINANCIAL RATIOS (3)

RATIOS USED IN CONNECTION WITH STOCK SHARES :

EQUITY RATIOS :

| | | |
|---|---|---|
| I. | EARNINGS PER SHARE : | NET PROFIT A/TAX = (Money)<br>NUMBER OF SHARES = (Units) |
| II. | DIVIDENDS PER SHARE : | DIVIDENDS PAID ANNUALLY<br>NUMBER OF SHARES |
| III. | PRICE-EARNINGS RATIO : | MARKET PRICE OF 1 SHARE<br>EARNINGS PER SHARE |
| IV. | YIELD : (%) | DIVIDENDS PAID ANNUALLY PER SHARE<br>MARKET PRICE OF 1 SHARE |
| V. | BOOK VALUE PER SHARE :<br>(usually 'common' stock | SHAREHOLDER'S EQUITY or NET WORTH<br>NUMBER OF SHARES |
| VI. | DIVIDENT PAYOUT : (%) | TOTAL ANNUAL DIVIDENDS PAID<br>TOTAL NET PROFIT A/TAX |
| VII. | WORKING ASSETS PER SHARE : | TOTAL ASSETS<br>NUMBER OF SHARES |

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Mark Weber

# T E A C H I N G
# M A T E R I A L S
# A N D
# O U T L I N E S
# F O R
# S L I D E S

SOURCE: OF FINANCE:

Refer Section: 9
Module: IV

# TYPES OF FINANCING

## SHORT TERM:

TRADE CREDIT: 'Revolving'

BANK OVERDRAFT: 'Revolving'
MUST HAVE A 'CLEAN-UP PERIOD'

LETTERS OF CREDIT: 'Due on presentation'
MAY REQUIRE A CASH DEPOSIT
Used for FINANCING of IMPORTS

BANKER'S ACCEPTANCES etc.

LEASING: NO OWNERSHIP, BUT TERM RESPONSIBILITY

HIRE/PURCHASE: LEASING WITH AN OPTION TO PURCHASE AT END

SALE/LEASEBACK: GIVE-UP OWNERSHIP; TAKE-BACK LEASE RIGHTS
WITH LEASE/RENTAL OBLIGATIONS
TYPES: 'NET' OF MAINTENANCE/ TAXES etc.

EXPORT CREDIT FINANCING: EACH COUNTRY HAS ONE,
USES TO PROMOTE OWN EXPORTS

NOTE: Introduce UNIDO FINANCIAL RESOURCES Books
for descriptions and addresses of E/C Insti

## LONG TERM:

LOANS: TYPES: DEBENTURES/SINKING FUND
COLLATERALIZED (SECURED)/UNSECURED
LOCAL/FOREIGN CURRENCY - PROBLEMS
THREE TYPES OF REPAYMENT SCHEMES

SHARE CAPITAL:
PREFERENCE - CUMULATIVE PREFERENCE etc.
COMMON STOCK - CLASSES/VOTING - NON-VOTING et
FOREIGN DEPOSITORY SHARES etc.

CONVERTIBLES // WARRANTS

# TYPES OF FINANCING

## GIFTS AND GRANTS AND LOANS :

GRANTS:

UNDP DEVELOPMENT FUND:

UNIDO - TRAINING

FEASIBILITY STUDIES

CAPITAL EQUIPMENT (FOR RESEARCH etc.

RESEARCH

TECHNICAL ASSISTANCE

BI-LATERAL AID :

NEGOTIATED DIRECTLY WITH COUNTRY OFFERING AID

SOMETIMES 'SOFT' LOANS FOR EQUIPMENT POSSIBLE

MULTI-LATERAL AID:

REGIONAL DEVELOPMENT BANKS

WORLD BANK

INTERNATIONAL FINANCE CORP.

GOVERNMENT GUARANTEES:

CONVERTIBILITY:

AGAINST EXPROPRIATION

RETURN OF CAPITAL

REPATRIATION OF PROFITS

OTHERS : OBLIGATIONS TO RE-INVEST A % OF PROFITS etc.

**ANNEX 10:** Introduction to UNIDO's Computer Model for Feasibility Analysis and Reporting (COMFAR)

UNIDO
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

VIENNA INTERNATIONAL CENTRE
P.O. BOX 300, A-1400 VIENNA, AUSTRIA
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# UNIDO

## Computer Model for Feasibility Analysis and Reporting

# COMFAR

Feasibility Studies Section

UNIDO

Vienna, 5 May 1983

SUMMARY

1. In view of the wide application of the Manual for the Preparation of Industrial Feasibility Studies (ID/206) since its publication in 1978, UNIDO has developed a Computer Model for Feasibility Analysis and Reporting (COMFAR). The purpose of COMFAR is to enable experts, consultants, consulting firms and UNIDO staff as well as international and national institutions active in the preparation, evaluation and financing of industrial investment projects, to facilitate and accelerate the computations required for the preparation and evaluation of financial statements, financial ratios, and rates of return for pre-feasibility and feasibility studies. COMFAR is also a further step towards standardization of pre-investment studies, as strongly recommended by the First Consultation on Industrial Financing, held in Madrid in October 1982.

2. The Model was completed in December 1982 and the programme is now fully operational. It has already attracted widespread interest. COMFAR has been installed in Turkey, and requests for its installation and application have been received from Ethiopia, Honduras, Madagascar, Oman, Zambia and other developing countries. Well known firms and banks as well as the UNDP express keen interest in the computer programme, and there seem to be very good prospects for installing COMFAR on a wide scale.

3. The programming work was sponsored by a grant received from the Austrian Federal Chancellery. About the same amount was provided out of UNIDO's Regular Budget for the systems analysis, programming and testing. The programme as it stands now is fully operational. Programme maintenance, updating and further development and improvement (e.g. translation into French and Spanish) are envisaged, funds will have to be secured to finance this future work, as well as training of users in developing and industrialized countries.

4. The COMFAR programme will be available against a lump sum contribution of US$ 9,500 to US$ 15,000 - depending on the assistance and training required for hardware and software installation - payable to a UNIDO trust fund, and it would mainly be used to cover UNIDO's direct costs (consultant fee, travel expenses, per diem) for training staff in COMFAR application, supply of a User's Manual, and for programme maintenance during a period of eighteen months. After this period an updated version of COMFAR will be made available. The COMFAR software itself would therefore be provided practically free of charge.

5. The comparative advantages of COMFAR, implemented on a personal computer are inter alia: easy access to the computer, a sophisticated but still very flexible financial model, the dialogue system guides the user through all operations, input error check and warning system, computer power allows repeated computations to analise sensitivity and risks involved and to approach optimal project alternatives, the report generation system prints the result tables ready for presentation in project reports.

## II. THE PROBLEMS

6. As manifested in the Lima Declaration and Plan of Action, it is the express intention of the international community that the developing countries should attain by the year 2000 a 25 per cent share in world industrial production. Among many other considerations, this endeavour is closely dependent on the developing countries' ability not only to negotiate successfully the new distribution of industrial capacities with Governments and industrialists of the developed world, but also, and at least equally important, to select investments commensurate with their development objectives and targets.

7. The experience gained by the developing countries in the preparation of pre-investment studies has been mixed. Such studies were frequently motivated by equipment sellers or were a part of a turnkey project and the specific problems and difficulties that were likely to be encountered in the project were not sufficiently stressed. In other cases, such studies were largely based on earlier experience with similar projects in developed countries, and then proved inadequate under the prevailing conditions. Furthermore, too many concepts of project preparation made it difficult for investment decison makers to consider an entire investment proposal in all its facets and to measure its impact as compared with the development objectives and targets. The quality of pre-investment studies has, thus, not kept pace with the more elaborate demands made on them. The standard and depth of studies are often not of a sufficiently high quality to ensure rational decision making at the successive stages of the pre-investment process. This deficiency has resulted in misallocation of resources, long gestation periods, investment cost over-runs, and the creation of excess capacities.

## III. THE UNIDO MANUAL FOR THE PREPARATION OF INDUSTRIAL FEASIBILITY STUDIES

8. With the publication of the Manual for the Preparation of Industrial Feasibility Studies (ID/206) in 1978, UNIDO has made a major contribution towards standardizing the terminology and approach to be used in the field of pre-investment studies and has thus provided the developing countries with a tool to facilitate the preparation of projects that are technically, financially and economically sound. The standardization of the applied methodology is of particular relevance to ensure that both users and producers of pre-investment studies are dealing with the same concepts. The Manual permits the prescription of detailed terms of reference to consulting firms, monitoring of their work and assurance of high quality of pre-investment studies. With the above Manual available in English, French, Spanish, Russian, Chinese, Turkish, Dahri, Hungarian and Czech, and being translated into Polish, German and Burmese and a present edition of over 65,000 copies and its wide application by consulting firms, development banks, the World Bank and its Economic Development Institute, investment project sponsors, etc., good progress has been achieved in the effort to standardize pre-investment work.

9. Since project planning is an interdisciplinary task requiring a team of engineers, economists, financial analysts, social scientists, businessmen and governmental administrators, the Manual is aimed at readers with different educational backgrounds and professional experiences from both developing and industrialized countries. The Manual is practical in approach; it aims to put the various feasibility studies into a similar framework with a view to making them more comparable than in the past.

10. The Manual has two parts: the first one concerns the different types of pre-investment studies (opportunity, pre-feasibility and feasibility studies) that can be applied to the industrial sector as a whole, and shows the information required at the various stages of decision making in the project selection process. The implications of undertaking one of the different types of pre-investment studies can thus be determined fairly clearly against the need in each case.

11. The second part constitutes the core of the Manual and its outline corresponds to the framework of a feasibility study.

Standard format of the table of contents of a feasibility study

(1) Executive summary

(2) Project background and history

(3) Market and plant capacity
- Demand and market study
- Sales and marketing
- Production programme
- Plant capacity

(4) Material inputs
- Materials and inputs
- Supply programme

(5) Location and site
- Location
- Plant site and local conditions
- Environmental impact

(6) Project engineering
- Layout and physical coverage of the project
- Technology and equipment
- Civil engineering

(7) Plant organization and overhead costs
- Plant organization
- Overhead costs

(8) Manpower
- Labour
- Staff

(9) Project implementation

(10) Financial and economic evaluation
- Total investment outlay
- Project financing
- Production cost
- Commercial profitability
- Socio-economic cost benefit analysis

* UNIDO Manual for the Preparation of Industrial Feasibility Studies, New York 1978; ID/206, pg.31 pp.

12. In the principal chapters, given above, related issues are grouped in such a way that their results can serve as input for the succeeding chapters. Three chapters deal with the basis of a project: its history and the overall economic context in which it will operate; the assessment of markets; the supply conditions and the resulting production and supply programmes. Together with the results obtained from the chapter on location and site selection, the production and supply programme serve as points of reference for the chapters

on choice of technology, equipment and civil engineering, and administration and manpower requirements. The concluding chapters are on implementation scheduling, financial analysis and issues related to economic evaluation. A bibliography is provided for each chapter, as is an index of main topics covered.

13. This format allows a stage-by-stage analysis of the various components of a feasibility study, with the sets of figures generated for each component gradually converging to the most important totals. This method also allows any single component of the entire study to be dealt with separately, within the overall logic of the study. The format was designed in this way because the true evaluation of an investment proposal can only be done correctly if data are collected properly during the preparatory stage.

14. Although the Manual is chiefly concerned with project preparation, the need for the wider application of cash-flow analysis in project evaluation prompted the addition of a presentation of the discounting and simple evaluation methods applied in financial evaluation. Thus, each chapter of the Manual contains several proforma schedules suitable for data collection. These schedules are designed in such a way as to correspond to the timing requirements of cashflow analysis. Furthermore, the schedules are sequential and can ultimately provide an accounting of all the major inflows and outflows of funds needed for financial evaluation and planning.

## IV. UNIDO'S COMPUTER MODEL FOR FEASIBILITY ANALYSIS AND REPORTING (COMFAR)

15. When writing the UNIDO Manual for the Preparation of Industrial Feasibility Studies , its structural layout was already designed with the objective of eventually developing an EDP-programme package to facilitate the fast computation of the statements needed for financial and economic analysis of an envisaged investment project. The COMFAR programme takes this objective fully into consideration and will greatly enhance these computations. The application of an EDP-programme also facilitates the computation of project alternatives during the preparation of the feasibility study. In this way it will be easier to approach the optimum solution of the project which is otherwise a very time-consuming task due to the high amount of computation work. COMFAR is a very suitable tool for investment decision makers, contract negotiation parties and project managers.

16. The COMFAR System has been designed to be run on transportable personal computers so that it can be used not only at headquarters, but also, much more importantly, for project analysis in the respective countries, e.g. at Industrial Project Planning Centres set up in developing countries. Consulting firms conducting pre-investment studies would be in a position to carry out all required computations in the field already, thus facilitating sensitivity and risk analysis as well as the process of finding appropriate project alternatives. The same applies for industrialized countries, where consulting firms would have the advantage of being mobile when carrying out the field work and discussing the results of pre-investment studies with their clients on the spot.

## V. WHAT IS COMFAR ?

17. The COMFAR Programme package is an important tool for the project analyst and decision maker who wants to prepare and evaluate industrial investment projects and to use computer power for preparation of cash-flow tables, balance and income statement projections following the UNIDO Manual for the Preparation of Industrial Feasibility Studies .

18. The COMFAR System is designed to be used on a micro-computer and due to its modular structure and segmentation its operation and control are nearly as convenient as on much larger computer systems.

19. COMFAR is a cashflow-oriented model and the user can simulate cash inflows and outflows of an industrial investment project. It is easy to learn to use the full power of COMFAR because the programme package is designed to be user-friendly, to operate in a dialogue mode and to guide the user through the Data Entry Procedure , Calculation of Results and Printing of Standardized Reports . The programme will check the data input and subsequent computations and display on the monitor screen messages for control of the programme execution. It will reject wrong answers and ensure that all basic data required for the following computations are saved in an external data file on diskettes. This file can be updated or modified and used again for computation of alternatives and sensitivity analysis.

20. The COMFAR System produces complete tables on initial and current investment, sales production programme, production costs, cashflow tables for financial planning, net income statements, projected balance sheets,discounted cashflow, and financial ratios; see Annex 1.

21. COMFAR is a very flexible tool for financial and economic analysis of industrial projects which, based on few essential input data, also provides for local and foreign cashflows in half-year periods during construction (pre-production phase) and automatic computation of a finance scheme.

22. COMFAR will enable teams of project planners to compute alternatives of feasibility studies. By applying the computer programme, feasibility studies become more transparent and allow the calculation of project alternatives already during the planning stage.

23. Detailed sensitivity analysis which is of particular interest for investment decision makers can be done in a matter of minutes or a few hours and not of days and will thus become more applicable in contract negotiations than before. Therefore, COMFAR has been made available on transportable personal computers to be used not only at UNIDO Headquarters, but by project planning teams in the field and during contract negotiations.

24. In summary, the COMFAR System

- facilitates the fast computation of the statements needed for economic and financial analysis of feasibility studies;
- facilitates the quick approach to optimum solutions ;

- enables the performance of sensitivity analysis in order to determine dependencies on input values obtained or available with broad error;

- facilitates contract negotiations ;

- facilitates negotiations of joint-ventures ;

- is available on transportable micro-computers ;

- can be easily installed ;

- facilitates project evaluation by financing institutions.

## VI. HOW COMFAR WAS DEVELOPED ?

25. When developing the COMFAR System the following tasks were carried out:

- preparation of a systems analysis;

- selection of a programming language (PASCAL);

- selection of computer hardware (for the time being APPLE);

- preparation of a detailed programming and data processing design;

- development and programming of the computer programme.

26. After reviewing several manufacturers, the decision was made to select the Apple III micro-computer with 256 Kb, 2 diskette drives (for flexible diskettes) with 140 Kb each, one 5 Mb "Winchester" disc, 1 dot-matrix printer including graphics and 1 daisy-wheel printer for the production of high-quality output reports. The micro-computer selected operates under the Sophisticated Operating System (SOS). The computer provides facilities for the production of graphic displays of tables, etc., in a user-oriented and simple manner. Furthermore the computer can be used for word processing.

27. A total of three man years of development work was required. The programme was completed in Fall 1982 and has since been tested in a number of studies. Although the programming team was aware of programmes in this field for large computers, and consulted programmes developed by the Kreditanstalt fuer Wiederaufbau, KOC Holding, Oesterreichische Industrieverwaltungs-AG, SNAMPROGETTI and others, the work by UNIDO entered new territory in designing such a programme for a micro-computer. The COMFAR programme is unique in that it is capable of handling tasks originally carried out only on large-scale computers and offers the possibility of significant economies for its users. The advantages of this concept are obvious and are fully acknowledged by many interested parties.

28. COMFAR was developed with a grant received from the Austrian Government and an equal amount from UNIDO's own funds. It is estimated that commercial software houses would have charged three to four times the costs. The programme as it stands now is fully operational. Additional programming work will, however, have to continue to

- adapt it to the new generation of personal computers which have larger capacities and are still faster;
- update COMFAR based on the experience gained;
- develop a fully automatic routine for sensitivity analysis;
- include social cost-benefit analysis;
- translate COMFAR into French and Spanish;
- train personnel in developing and industrialized countries to install COMFAR.

Additional funding will have to be secured to finance this future work.

## VII. ADVANTAGES OF COMFAR AND HOW TO OBTAIN IT

29. The comparative advantages of COMFAR can be highlighted as follows:

- The personal computer allows to use COMFAR whenever needed, the user does not need access to computer centres.
- The COMFAR model is easy to use, although it is relatively sophisticated but still flexible. The user may compute simple cases as well as complicated investment projects; accounting, financing, tax and various other programme routines are available to facilitate project analysis.
- A carefully designed User's Manual gives all information for practical work as well as the theoretical background of the COMFAR model.
- Computer power as provided by COMFAR allows the user to compute and analise numerous project alternatives quickly and at practically no run time cost. This would improve the quality of feasibility studies considerably without increasing the time required for financial project analysis.
- Result tables are ready immediately after computation, there is no need for typing of tables folowed by proof reading and corrections of typing errors.

30. Even prior to its official presentation to outside users which is now taking place, COMFAR has already received much attention. Requests for its installation and application were received from Ethiopia, Honduras, Madagascar, Oman, Zambia, Thailand and other developing countries. In late 1982 COMFAR was installed in Turkey. Well known firms and banks from industrialized countries show keen interest in the computer programme and have even indicated their willingness to compensate UNIDO for the costs incurred in the past and to be expected in the future. Offers were received to obtain exclusive rights to install COMFAR in major industrialized countries.

31. During a presentation of COMFAR to the Administrator of the United Nations Development Programme (UNDP) in New York in March 1983, UNIDO received his support and strong recommendation of eventually installing the system at UNDP Headquarters and in a number of its larger field offices. Other UN agencies have requested COMFAR, the Economic Development Institute (EDI) of the World Bank plans to use COMFAR in its industrial and development banking seminars in Washington D.C.

32. Likewise a number of socialist countries have also expressed great interest to obtain COMFAR for their pre-investment work.

33. In view of the interest received for COMFAR from countries of different economic and social systems, and keeping in mind the additional development costs expected to advance the system still further and the costs to be incurred to install COMFAR, it is envisaged to ask the ordering parties for a contribution to recover these expenditures.

34. The COMFAR programme will be available against a lump sum contribution of US$ 9,500 to US$ 15,000 - depending on the assistance and training required for hardware and software installation - payable to a UNIDO trust fund, and it would mainly be used to cover UNIDO's direct costs (consultant fee, travel expenses, per diem) for training staff in COMFAR application, supply of a User's Manual, and for programme maintenance during a period of eighteen months. After this period an updated version of COMFAR will be made available. The COMFAR software itself would therefore be provided practically free of charge. In the case of developing countries, the fee could in most cases be financed from UNDP project funds or other technical assistance sources.

35. Government authorities, development banks, consulting firms and other interested parties from developing countries should direct all requests for UNIDO assistance to set up COMFAR to the Resident Representative of the United Nations Development Programme (UNDP). UNIDO is represented in a number of developing countries by a Senior Industrial Development Field Adviser (SIDFA). The staff of the UNDP Resident Representative's office and the SIDFA will be in a position to explain in detail the procedures to be followed and how to contact UNIDO.

36. Further information can also be obtained directly from UNIDO. Requests from interested parties originating from industrialized countries should be addressed directly to:

Werner Behrens, Head
Feasibility Studies Section
Division of Industrial Operations
UNIDO
Vienna International Centre
P.O.Box 300
A-1400 Vienna, Austria

Telex: 135612
Telephone: (0222) 2631/3744

**ANNEX 11:** National Case Study: SUNTI SUGAR PROJECT
Technical Data

# NATIONAL CASE STUDY

## SUNTI SUGAR PROJECT

This National Case Study is designed as teaching material during the

"Training Course in Industrial Project

Preparation, Evaluation and Financing",

held in Lagos, Nigeria, from the 5th of September to the 14th of October 1983. All tables and schedules which are used for Commercial Profitability Analysis and Financial Analysis in this National Case Study are described in UNIDO's Manual for the Preparation of Industrial Feasibility Studies", ID/206. All schedules concerning the economic evaluation of the Project can be found in the "Manual for Evaluation of Industrial Project" ID/244.

Both manuals have been distributed to all participants, to be used in future. All basic information concerning the technical part as well as investment and operating costs of SUNTI SUGAR PROJECT have been taken from a Feasibility Study on this project, submitted in 1974 to the Nigerian Government. Therefore the costs and prices were the current at that time.

Lagos, 23:9:1983

JOSEF GLOECKL.

SUNTI SUGAR COMPANY LTD.

# FEASIBILITY STUDY

FOR

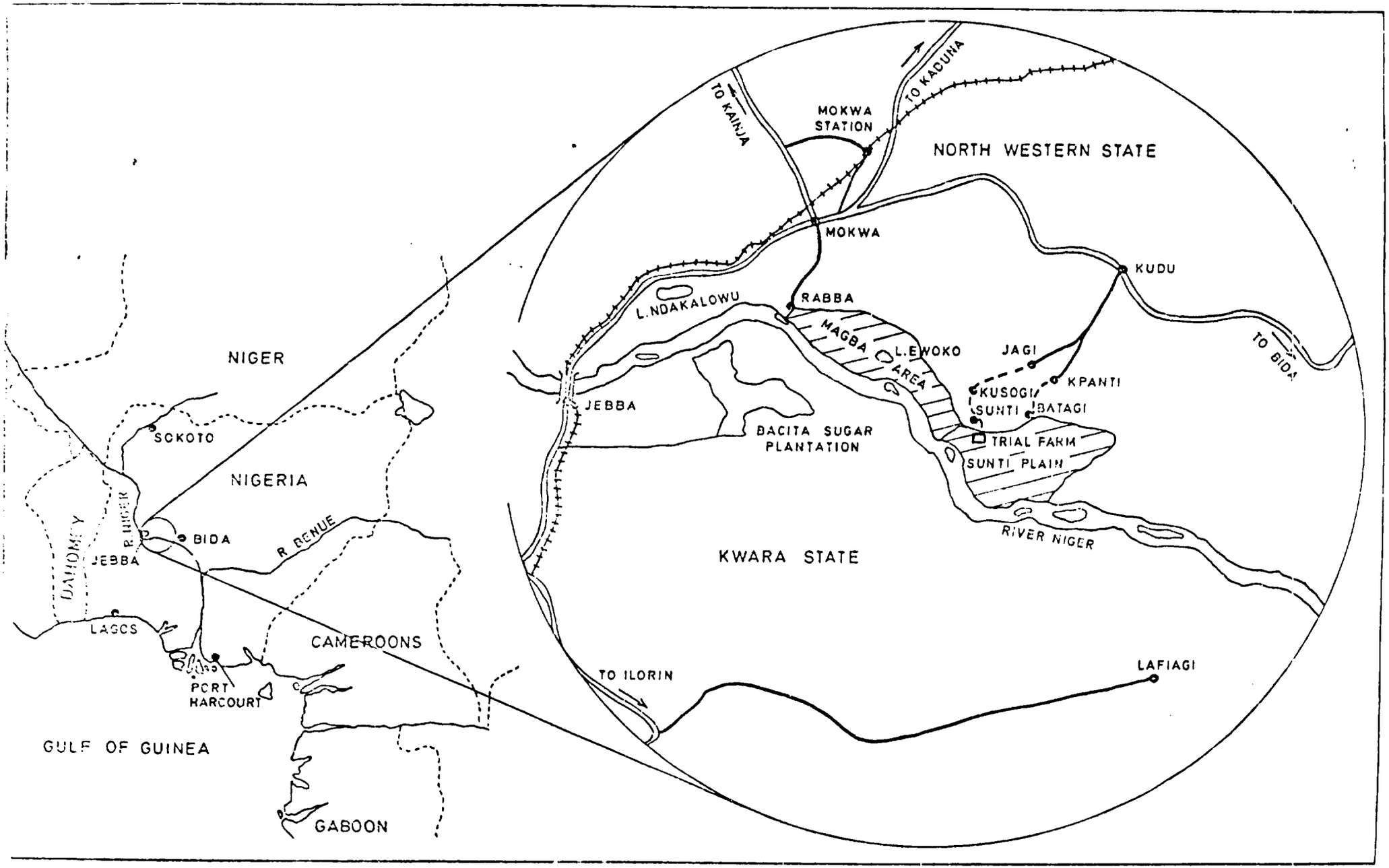
SUNTI SUGAR PROJECT
NORTH WESTERN STATE
REPUBLIC OF NIGERIA

## V O L U M E  I

MAIN REPORT CHAPTERS I TO III

Tate & Lyle Technical Services Ltd.,
No. 1 Cosmos House,
Bromley Common, Bromley,
KENT. ENGLAND.

May 1974


TO KAINJA
MOKWA STATION
TO KADUNA
NORTH WESTERN STATE
MOKWA
KUDU
L.NDAKALOWU
RABBA
MAGBA
L.EWOKO
JAGI
AREA
KPANTI
KUSOGI
SUNTI
BATAGI
TO BIDA
JEBBA
BACITA SUGAR PLANTATION
TRIAL FARM
SUNTI PLAIN
RIVER NIGER
KWARA STATE
TO ILORIN
LAFIAGI
NIGER
SOKOTO
NIGERIA
R. NIGER
BIDA
R BENUE
JEBBA
DAHOMEY
LAGOS
CAMEROONS
PORT HARCOURT
GULF OF GUINEA
GABOON

# CHAPTER I

# SUMMARY

## 1.1 INTRODUCTION AND GENERAL BACKGROUND

1.1.1 Tate & Lyle Technical Services Ltd. and Taylor Woodrow International Ltd. have carried out a feasibility study of the Sunti area of the North-Western State of Nigeria. Taylor Woodrow International Ltd. were engaged to carry out the hydrological and civil engineering aspects of the study. The site work and report writing for the study occupied the period from November 1973 to May 1974 inclusive.

1.1.2 Visits were made to the Sunti plain and the neighbouring area of Magba by five members of the consultants staff in company with the Sunti project site manager. The consultants were able to meet members of the administration of the Federal and North-Western State Governments concerned with agricultural and industrial development of the region and also to meet representatives of the railway, electrical power supply and commercial companies who might participate in the possible sugar project. Several consultants visited the local Bacita sugar factory in Kwara State and the associated cane lands and received much assistance from the Nigerian Sugar Co. Ltd. On completion of the site visits, supervisory directors and other staff have contributed to the preparation of this final report.

1.1.3 During the November to December 1973 visits, access into the Sunti plain was limited by flooding and was made by driving traces and walking as far as permitted by the conditions existing. The Sunti and Magba areas had dried out considerably by February 1974 and during the second visit period it was possible to obtain access to most of the probable cane growing areas including a traverse of almost the entire length of the Magba area. Subsequently in March 1974 the site project manager was able to penetrate to the North-Eastern periphery of the project area originally demarcated by the Niger Valley Survey Appraisal Mission of September - December 1971. This North-Eastern section was not covered by the soil survey of December 1972 to March 1973 owing to the area being, at the time, inundated by swamp and flood water.

## 1.2 COMPARISON WITH THE BACITA AREA

1.2.1 Significant differences were noted in the environment existing at Bacita and Sunti which will affect cane growth and yield potential and which have been taken into account in arriving at production levels. The principal differences are:-

(1) The Sunti area is much more dissected with sandy "islands" protruding through potential cane growing areas.

(2) In undeveloped areas of Bacita the growth of the natural vegetation is somewhat more vigorous than at Sunti, indicating that the general level of productivity at Sunti may not be as high as at Bacita, at least on the lighter type soils.

(3) Stretches of soil of uniform character and even topography are less common in the Sunti area compared with Bacita, although there is evidence that in the Magba area conditions are generally more favourable in respect of topography and probably as regards fertility than is the case at Sunti.

(4) Large areas of the eastern sector of the Sunti plain have peat overlying clay, whereas, at Bacita, there is only one very small area under cane having what is regarded as a similar peat/clay combination. The early growth of the cane on this area is, however, promising.

1.2.2 It is considered that, based on the historical evidence available at Bacita and considering the soils, cane varieties available and climatic factors, an average yield of 79.4 tonnes of cane per hectare can be

forecast with a likely ultimate cane to sugar ratio of 10:1 when producing refined sugar.

## 1.3 CANE AREAS AND PRODUCTION TARGETS

1.3.1 In the early stages of the study it became apparent that there is, in the Sunti plain alone, insufficient land suitable for growing cane, to establish a viable size of sugar factory and that, to obtain enough land to produce 40,000 tonnes of sugar per year, the cane growing area must extend as far as Lake Ewoko in the Magba zone. With a further extension as far north-westwards as the Rabba rice scheme 50,000 tonnes of sugar per year is probable. The introduction, later, of non-flowering cane varieties and, with experience gained in growing cane in this somewhat difficult area, could lead to a possible increase to 60,000 tonnes of sugar per annum.

1.3.2 The study team have identified a gross area of land generally suitable for cane of 9,860 hectares of which 6,410 hectares would be the net area of land actually planted in cane and is made up of four principal zones as follows:-

| | Gross Area Hectares | Net Area Hectares |
|---|---|---|
| 1. Sunti plain, from Dogho to Sunti East | 4,400 | 2,860 |
| 2. Sunti plain, S.E. Swamp Area | 800 | 520 |
| 3. Magba, up to Lake Ewoko | 3,000 | 1,950 |
| 4. Magba, Lake Ewoko to Rabba Rice Scheme | 1,660 | 1,080 |

## 1.4 DRAINAGE AND IRRIGATION

1.4.1 The regime of the river adjacent to the project area has been studied to determine the flood protection and drainage measures necessary, as has also the hydrology of the other rivers and drainage courses discharging into the project area to determine the extent of diversion works required. In addition to general run-off from the escarpment behind the flood plain, two rivers discharge into the project area from the north. Both rivers flow for a considerable portion of the year and appear to be responsible for much of the prolonged waterlogging occurring in the northern part of the Sunti area.

1.4.2 Water level gauges established in the lakes, to determine the relationship between water table and Niger levels and to obtain an approximate water balance equation for the flood plain, indicate that underground percolation from the Niger into this aquifer is not likely to be great.

1.4.3 Although the Kainji dam has considerably reduced peak flood flows, surface inundation of the project area is still possible in exceptionally wet years. Analysis of the preliminary gauging data indicates that there is a risk of the Niger overtopping its natural banks and flooding the project area once every four or five years.

1.4.4 As the risk of inundation from the Niger once every four or five years is unacceptable, a flood protection embankment surrounding the project area is considered necessary, constructed of compacted soil to a height which will give protection against all Niger floods up to a 1 in 100 recurrence.

1.4.5 Cut-off drains have been proposed along the foot of the escarpment to intercept surface water run-off draining into the project area from the north. Diversion and channelisation of the two rivers entering the project area from the north is necessary to prevent flooding.

1.4.6 Drainage works are required within the area for removal of rain water, surplus irrigation water and some underground percolation from the

Niger. For successful sugar cane cultivation the groundwater table should be maintained at least 1 m. below ground level and drainage works have been planned to maintain groundwater control and provide adequate removal of surface water at all times. In certain areas of peat soils facility for controlled waterlogging is provided to prevent oxidation of the peat.

1.4.7 A system of deep drainage canals proposed follows the natural drainage paths of the flood plain, the main collector drains following lines of low-lying natural lakes running parallel to the river.

1.4.8 The source of water for irrigation is the river Niger and, although borehole wells may be possible, extensive groundwater surveys and pumping tests would be necessary before this method could be proved. The chemical quality of the water extracted from the Niger is good for irrigation with only small amounts of suspended matter carried during the irrigation season.

1.4.9 Drainage canals have been designed where possible to serve as irrigation supply canals, with water extracted from the Niger during the dry season through automatic float operated regulator gates and fed into main collector canals. Dual purpose drainage/irrigation branch canals serve the irrigated area to supply the sprinkler pressure pumping stations. Water levels are generally lower than the minimum Niger level so pumping from the Niger is not required at the intake sites.

1.4.10 Although the Nigerian Electrical Power Authority will be able to supply the area with electrical power at 33 Kv, it would not be prudent to rely on it being available at site until November 1977.

1.4.11 It has been proposed to use diesel power throughout for irrigation and drainage in the earlier phases of the development, and, after N.E.P.A. power is available on site, the remainder of the scheme will be electrically powered. Due to isolation and intermittent use it is proposed that the drainage lift stations should continue to operate under diesel power on a permanent basis.

1.4.12 Phasing of the project is designed to develop the most easily drained soils first, starting with the Sunti area, so that during construction flood risk will be minimised as far as possible. The areas nearest the factory will be completed in the initial stages thus minimising cane haulage.

## 1.5 THE DEVELOPMENT PROGRAMME

1.5.1 The development programme proposed allows for the first production of sugar in the fourth development year i.e. November 1976 to October 1977. The normal crop period will be from mid-October to the end of April, a total of 196 days gross, but in the first crop the gross crop length will be only 71 days, during which it is anticipated that approximately 8,099 tonnes of sugar will be produced. This tonnage will increase yearly at 16,209, 24,558 and 32,608 until, in Year VIII (Crop No. 5), 40,000 tonnes are forecast. This point of production is reached when all of the land up to Lake Ewoko will have been developed. The additional land area is projected, from Lake Ewoko to the Rabba rice scheme, to occupy two years and to produce 45,000 and 50,350 tonnes of sugar respectively.

1.5.2 Road access to the Sunti plain, at present only possible by a dry season road via Kudu and Jogi is to be improved by the North-Western State Government to provide a temporary all weather road. A main, surfaced road to carry heavy and frequent traffic to the factory site and to serve as a major cane transport road will be constructed to connect directly from Rabba via the present Mokwa to Rabba road. These road infrastructures will be of general benefit to the communities existing in the area as well as to the cultivation of sugar cane.

1.5.3 Two other major roads will be constructed within the Sunti plain for the transport of cane, and a network of secondary roads connected to the three major transport arteries will provide a link for transport and access into the cane fields.

1.5.4 A satisfactory site for the factory has been found, taking into account the likely location of the cane growing areas. The site chosen is

to the north of the Sunti plain and to the east of the Yunko river. Areas are located near to the factory site for housing staff and permanent labour. Seasonal labour will be housed in other areas. An airstrip site was found on the eastern side of the factory and housing complex.

1.5.5 An assessment has been made for the requirements for a complete factory with refinery to produce granulated refined white sugar. Bearing in mind the agricultural forecasts indicated in the foregoing, in respect of crop length, cane yield and sugar rendement, it is expected that the factory will be constructed in two stages, the first having a mean crop average capacity of 2,300 tonnes of cane per day and the second a capacity of 3,500 tonnes cane per day.

## 1.6 MARKETING OF PRODUCTS

1.6.1 This study includes a consideration of the total market for sugar in the whole of Nigeria and suggests the Sunti productions should be packed in 50 Kg. bags and small pre-packs, as granulated sugar. Consideration should be given in the future to the production of ½ Kg. cartons of cube sugar. Operating and packaging costs in this report are based on the use of polypropylene with the possibility of packing the entire production in 50 Kg. bags or, alternatively, up to 40% in small packs and the remainder in 50 Kg. bags. This is, however, based on the availability and costs of polypropylene as in December 1973 but present uncertainty on the supply and cost of this material may require the use of other packaging materials. Packing machines for use of differing materials whilst of a differing type, will have a similar capital cost.

1.6.2 The market survey indicates that the anticipated demand for sugar, taking into account other projects presently being considered for Nigeria, will absorb all that the Sunti Sugar Company will be able to supply and that the market will welcome it if the sugar can be produced at economic prices. A price of ₦270 per tonne, ex factory, packed in 50 Kg. bags is considered to be economic (see Chapt. VIII). The molasses can be sold for ₦7.75 per tonne ex factory to the local cattle operation with an anticipated uptake of 5,000 tonnes per year, and it is forecast that a price of ₦13.0 per tonne, ex

Mokwa railhead storage, can be anticipated for export molasses.

1.6.3 As to by-products, the costs of alcohol and molasses are, at the time of writing this report, very variable. Present prognostications are that, for the first two crop years, the molasses produced will be absorbed by the cattle ranch at Mokwa and that, thereafter, the surplus will be purchased, ex Mokwa storage tank, for rail shipment to Lagos. Production of alcohol is not included at this stage owing to instability of world commodity prices, the probability of a very small increase in revenue and job opportunity, and the undesirability to extend and complicate the sugar project at this time. A further feasibility study into alcohol production is recommended after the second or third crop.

## 1.7 FINANCIAL CONSIDERATIONS

1.7.1 Capital costs for all aspects of the sugar project development, excluding infrastructure works which would not be borne directly by the project, have been estimated and total ₦46.2 million, made up of ₦43.2 million in Phase 1 and ₦3.0 million in Phase 2. Of the total ₦43.7 million represents original equipment costs, the balance comprising replacement equipment during the period to 1985. Assuming a price of ₦270 per tonne for bagged sugar and ₦300 per tonne for pre-packed sugar, equity of ₦20 million, the project is projected to come into profitability in 1981 and to start reducing its overall borrowing position in the same year.

1.7.2 Return on Capital: It takes a considerable time for income to build up to a level sufficient to service the loans, but conversely, by 1983 when the factory reaches a production level of 50,000 tonnes per annum, total operating cash income (before interest) reaches a plateau at some ₦7.6 million per annum, of which some ₦6 million represents the return on capital employed of ₦34 million. Assuming constant values over a 25 year project life, the average return on capital employed, before taxation, is estimated at 10.9% and the DCF rate of return at 8.5%. However, if inflation continues over the life of the project, the return on capital employed should rise substantially over the years as increasing trading profits are earned in a project whose capital costs were incurred at 1974/75 prices.

1.7.3 Underlying Assumptions: The assumptions underlying the preliminary financial projections are as follows:-

(a) A general 5% import duty will be levied on all imported items, although this may be considered as a contingency if the company succeeds in obtaining rebates of duties paid.

(b) Exchange rates are based on the forward projected rate at 18th March 1974 of ₦1.0 = £0.67 Sterling.

(c) Costs of land preparation are the non-recurrent costs up to Year IX of the project estimated at March 1974 values.

(d) The replacement programme for agricultural and transport machinery will commence in Year VII and run for six years to Year XII inclusive, at an approximate average cost of ₦302,000 per annum, representing a seven year average life of the equipment.

(e) The daily factory capacity at stage one will be 2,300 tonnes cane per day and, at stage two, 3,500 tonnes per day.

(f) Prices for plant and equipment are based on values as at 18th March 1974.

(g) Year IV is the first year of production.

(h) All sugar manufactured is refined white and sold as granulated sugar in bags or pre-packs.

(i) Cultivation, harvesting and transport costs shown in Table No. 9.5 are the total incurred, assuming all of the functions are carried out by company staff, labour and equipment. Wherever farmers supply cane, it is assumed

that the cost of cane to the factory will be the same as if produced by the company.

(j) The figures included under revenue assume a constant value of granulated refined sugar of ₦270 per tonne, ex factory, and that molasses will be sold ex Mokwa railhead storage tank at ₦13 per tonne. Costs of transporting molasses at ₦5.25 per tonne from the factory to the Mokwa storage tank have been allowed to give an ex factory price of ₦7.75, the same as that for 5,000 tonnes sold annually to the local cattle ranch.

(k) Interest rates of 7% on suppliers credits in respect of off-shore purchases, and 9½% on other borrowings, have been assumed.

## 1.8 MANAGEMENT

1.8.1 It is recommended that management of the project should be on the following lines. The Sunti Sugar Company will be responsible for setting up and operation of the industrial facilities including the factory and machinery maintenance facility, together with the irrigational, drainage and flood protection works for the whole project area. It would also cultivate the majority of the land area and produce, harvest and transport cane from it.

## 1.9 OUTGROWERS (CANE FARMERS) SCHEME

1.9.1 The company will also be responsible for the land preparation and development up to and including planting of cane for cane farmers, also loading and transport of cane on the basis of being a contractor working for the farmer. The farmer will be responsible for all post planting operations, cane cutting and the maintenance of fields after harvesting in respect of the following ratoon crop. The company will provide cane farmer liaison services to ensure overall control of operations. It is proposed that the

company should produce all of the cane up to that sufficient to manufacture 40,000 tonnes of sugar and thereafter additional land would be allocated to farmers so that ultimately they would produce approximately 15% of the total cane supply.

## 1.10 FACTORS IN FAVOUR OF THE PROJECT

1.10.1 Taken individually a number of favourable factors have been shown to exist which would be satisfactory for the sugar project.

(1) In general, soils, topography and water supplies are satisfactory for economic production of cane.

(2) There is an established cane growing industry in the area which removes doubts as to the general suitability of the region for cane production.

(3) There is no evidence of the presence of any unsurmountable pest or disease which would inhibit successful development of a major project.

(4) There is an expanding market for sugar in Nigeria which will not be satisfied by present and projected future manufacturing capacity, thus all of the likely production at Sunti can easily be absorbed in the North-West of the Country.

(5) The projected ex factory price of sugar is sufficient to encourage adequate investment.

(6) Opportunities will be created for career development of skilled management and industrial trainees.

(7) Besides offering direct employment opportunities to labour in the North-West State there will be further

opportunities for increasing the economic activity and prosperity in the district.

(8) The social amenity of the Sunti and Nagba areas will be extended by development of the infrastructure of the project area.

(9) As the scheme reaches a size where the basic economic cane supply to the factory is ensured, opportunities will be created for independent farmers to participate in growing cane under guidance and with assistance of the company.

## 1.11 FACTORS LIMITING THE ECONOMIC VIABILITY OF THE PROJECT

1.11.1 The following factors, whilst not preventing the project being viable, tend to limit it and to some extent counter the factors in favour given in the preceding section.

(1) The shape and area of suitable land available within economic cane haulage distance limits production.

(2) The land is broken up topographically with the result that land development and irrigation costs per hectare will be more expensive than, for example, at Bacita or Numan.

(3) As the area is remote and undeveloped, infrastructure costs will be higher than in less remote areas.

(4) It must be recognised that Nigeria is short of skilled human resources as far as highly mechanised sugar cane farming involving advanced irrigation and sugar manufacturing technology are concerned.

# CHAPTER II
# INTRODUCTION

## 2.1 BACKGROUND TO SUGAR PROJECT AT SUNTI

2.1.1 The possibility of undertaking a major sugar project in the Sunti plain and Magba areas has been under consideration for some years and a preliminary study was carried out in November 1972.

2.1.2 The region under study is situated on the northern bank of the river Niger in the North-West State of Nigeria extending from 15 - 35 Kms. due west of Jebba bridge and south of the Mokwa to Bida road. Sunti is 550 Kms. from Sokoto, the State capital.

2.1.3 Significantly there has been a sugar factory and plantation for ten years at Bacita approximately 25 Kms. away in a direct westerly line and to the south of the river Niger in Kwara State. This factory at present has a production of around 30,000 tonnes sugar per annum and is reported to have a projected future throughput of 40,000 tonnes annually.

2.1.4 The greater part of the region has not been developed, otherwise the agricultural activities of the region are dominated by rice, guinea corn, maize, sorghum and casava, all being of relatively small area and mainly for subsistance purposes. A government cattle ranch is located at Mokwa and there is a pilot rice development scheme at Rabba at the north-western tip of the Magba area.

2.1.5 The only activity within the Sunti plain and Magba areas, apart from some rice farming on the fringes, is the grazing of cattle driven there during the dry season by the Fulani herdsmen. Considerable numbers of cattle were encountered during the study at site but no permanent dwellings were found. The only permanent village within the project area is a high sandy plot, unsuitable for cane growing, by Lake Ewoko in the Magba zone.

2.1.6 Traditionally Nigeria has imported all her sugar as refined white sugar and mainly in the form of cubes. Within the last ten years the

first home produced sugar has been made at Bacita. Some of this is sold for cubing by Tate & Lyle (Nigeria) Ltd. In the years 1970-1973 there has been a steady increase in consumption in Nigeria, whilst at the same time the price of sugar on the world free market has risen considerably. These facts, together with the forecast of an increasing per capita consumption in Nigeria from the present 2.75 kilos per annum to 3.50 kilos per annum within the next ten years, has given rise to the need for developing greater home sugar production to meet the new demand.

2.1.7 The area, which has a history of successful cane growing at nearby Bacita, has a library of information on soils, climate and topography which are contained in the following:-

Niger Valley Survey Appraisal Mission, September/December 1971.
(Overseas Development Administration of the British Foreign & Commonwealth Office).

Aerial Photographic Survey of Sunti Plain and Magba Area, March 1972.
(Hunting Surveys Ltd.).

Visit to the North-West State of Nigeria to determine a suitable site for sugar cane production in the Sunti area, November 1972.
(Tate & Lyle Technical Services Ltd.).

A detailed Soil Survey of the Sunti area, North-Western State, Nigeria, July 1973.
(Hunting Technical Services Ltd.).

2.1.8 These factors have prompted an increasing interest in developing a cane sugar estate in the Sunti plain, and to this end a consortium was formed with equal participation of the Federal Military Government of Nigeria, the North-West State Government and Tate & Lyle (Nigeria) Ltd., to carry out cane growing trials and produce a feasibility study which

Tate & Lyle Technical Services Ltd. were engaged to undertake. A company, to be known as Sunti Sugar Company Ltd., has now been formed by the consortium members to promote the full development of the Sunti sugar project.

2.1.9 The object of the feasibility study was to prepare a 'bankable project' in accordance with the practices of the International Lending Agencies. Besides a full description of how the project would be initiated, estimates were to be provided of both the capital and operating costs involved. Analysis of various economic factors, such as the market demand and the selling price of sugar, were to be investigated in order to arrive at an estimate of the likely return on capital.

## 2.2 TRIAL CANE FARM

2.2.1 The embryo Sunti Sugar Company commenced operations on 31st October 1973 with the objective of locating a representative plot of land sufficient to plant 8 hectares of cane under irrigation. The site project manager selected an area to the south of Sunti lake and, assisted by equipment loaned by the North-West State Government, constructed an access road to the site, thereafter clearing and preparing the land. An overhead irrigation system was installed and cane planted, this phase of the work being completed by mid-March 1974.

## 2.3 THE FEASIBILITY STUDY - ITINERARIES

2.3.1 Tate & Lyle Technical Services Ltd. sent a team of consultants to Nigeria and the following personnel visited the country between the dates stated:-

2.5.18 A topographical and soil survey was carried out in the area of 102 hectares selected as being suitable for the next phase of development.

2.5.19 The site investigations were concluded by 21st February 1974 and the consultants' staff returned to their Head Offices to prepare full details of the study report. An interim report was issued on 28th February 1974, and a preliminary report on 30th April 1974.

2.5.20 In view of the desire to produce sugar from Sunti at the earliest possible time a programme was produced which requires a 102 net hectares cane development in 1974/75 and 1,044 net hectares in 1975/76, with sugar first manufactured in 1976/77. To this end, in order to allow early consideration of the financial implications and decisions to be made, it was decided to produce a preliminary report.
A time chart of operations is shown on Table No. 2.1.

## 2.6 LAYOUT OF THE REPORT

2.6.1 The report commences with two chapters describing the considerations of the Sunti/Magba area from an agricultural viewpoint and an assessment of the irrigation and drainage factors affecting the possible sugar project. It continues with plans for the agricultural development, harvesting and transport along with factory facilities that will be required, in each case referring to the costs involved. Consideration is given to a scheme for outgrowers and a chapter follows containing a survey of the sugar and by-products markets. The report concludes with the financial and economic analysis, being a synthesis of the information developed in the foregoing technical sections.

2.6.2 All organization and personnel matters such as the number of staff and labour required are dealt with respectively under each department as their individual contributions to the project are reviewed and planned. The necessary financial structure of the project is fully explained in the chapter on financial analysis.

2.6.3 The textual matter of the report is being included in Volumes I & II and appropriate appendices in Volume III. To facilitate reference all data

and financial tables pertinent to the report have been bound separately in Volume IV and cross referenced to the text in Volumes I and II. Similarly maps, plans and diagrams are enclosed separately in Volume IV.

## 2.7 ACKNOWLEDGEMENTS

2.7.1 Grateful thanks must be expressed to the staff of various departments of the Federal and North-Western State Governments who gave valuable assistance and time to the consultants, also the management and staff of the Nigerian Sugar Co. Ltd. with whose help much informative data was obtained. Acknowledgement has to be given to Tate & Lyle (Nigeria) Ltd. for making arrangements for accommodation and passages and for obtaining information requested by the consultants. Without the interest, assistance and collaboration of all these people and many others, the work of the consultants could not have been completed.

cane and produce sugar at competitive prices, or that capital and operating costs have been exaggerated. Given the recent large escalations and equipment prices (up to 35% over the last 12 months) and the high infrastructure costs, apart from those already mentioned, the cost of setting up this project is bound to be high. Many of these costs, however, would normally be provided by Government or Local Authorities in other sugar producing countries, as for example, water supplies, flood protection, roads (except for farm tracks), bridges, power supplies, schools and formal training establishments, houses, hospitals, sewage and public services, workers transport and public health services, all of which will have to be paid for by the company in the absence of any agreement to the contrary. If it was Government policy to accept those costs, on the basis that they are investment costs common to any agricultural and social or economic need, the apparent capital cost to the company of the Sunti project could be reduced significantly. The question of the allocation of infrastructure costs between State or Federal Government and the company clearly needs to be investigated, so that decisions can be taken on investment and financing.

9.1.8 Contingencies have been included in the capital costs for the factory and civil works, but not in either the agricultural equipment costs, which are taken as at March 1974, nor in the operating costs of either field or factory. However, it is probable that the 5% import duty included in the cost of all imported items could be reclaimed, thus effectively providing a contingency. Furthermore, the cost of labour has been based on a minimum rate some 40% above the legal minimum of 70 Kobo per day, so that wage increases following the Udoji Commissions hearings have been discounted.

## 9.2 FINANCIAL TABLES

9.2.1 Projected Profit and Loss Account: Based on the revenue and cost assumptions shown in supporting tables, the company comes into profit in Year VIII (1981), the fifth year of production.

9.2.2 Projected Cash Flows: Finance for capital expenditure, working capital and losses in the early years are provided by a ₦20 million of equity, ₦23.6 million of suppliers credits, and other borrowings which peak

at ₦27.9 million. For the purpose of the projections, "other borrowings" have been used as a balancing figure, though it is probable that the company would issue debentures on fixed terms to cover the major part of this financing requirement. An interest rate of 7% on suppliers credits and 9½% on other borrowings is used. The projections are shown in Table No. 9.2.

9.2.3 Projected Balance Sheets: Table No. 9.3 shows balance sheets for twelve years. By 1985 the cumulative loss has been reduced to ₦1.3 million, and a positive retained earnings position will be reached in 1986, subject to dividend policy. It is understood that under Nigerian Company Law dividends can be paid from current profits, although there may be a negative retained earnings balance.

9.2.4 Revenue and Cost Breakdown: A price for bagged refined sugar of ₦270 per tonne and of ₦300 per tonne for pre-packed sugar is used throughout the projection (Table No. 9.4), and a molasses price of ₦7.75 per tonne. It is assumed that all sugar will be sold within the crop period, the balance of the year's requirements being met by imports. As Nigeria approaches national self-sufficiency in sugar more stocks will need to be carried to support a year round marketing effort for the company's own production.

9.2.5 Agricultural Operating Costs: Cane production builds up from 85,000 tonnes in 1977 to some 500,000 tonnes by 1983. Table No. 9.5 shows the breakdown of agricultural costs by class of expenditure. A future crop expenditure item has been included to reflect the fact that the financial year starts at the beginning of the cropping period, and that the cultivation costs relating to sugar produced in a given year are actually incurred in the previous year.

9.2.6 Projected Factory Operating Costs: Factory operating costs, broken down into staff, labour and materials are shown in Table No. 9.6. The decline in staff costs from 1980 on reflects the replacement of expatriate staff (with overseas service allowance costs) by nationals.

9.2.7 Projected Refinery, Packing and Warehousing Operating Costs: Table No. 9.7 shows the manufacturing costs not included in Table No. 9.6. A similar pattern of staff costs is shown, but the key cost is packaging materials, which accounts for 67% of the total costs in this area, indicating that examination of the possibility of using alternative packaging materials could be useful.

9.2.8 Projected Administration, Housing and Roads and Sundry Operating Costs: These costs, which are detailed in Table No. 9.8, include a substantial ₦500,000 provision for training costs, as well as the costs of operating the Mokwa railhead installation and a Lagos office.

9.2.9 Capital Expenditure Summary: The capital expenditures directly related to the sugar project shown below are summarised from Table No. 9.9 in which they are shown by year. It should be noted that the cash flows for these purchases are based on probable financing terms, and are shown in Table No. 9.15.

Summary of Capital Expenditure

| | Local | Off-Shore | Total |
|---|---|---|---|
| | ₦000 | ₦000 | ₦000 |
| Land Development Costs | | | |
| Non-Recurrent Agricultural | 971 | 491 | 1,462 |
| Irrigation, Drainage and Flood Protection | 4,241 | 2,889 | 7,130 |
| Recurrent Agricultural | 184 | 6,412 | 6,596 |
| Factory and Refinery | 3,343 | 13,542 | 16,885 |
| Administration | 1,540 | 494 | 2,034 |
| Housing, Roads and Sundry | 6,434 | 5,728 | 12,162 |
| | ₦16,713 | ₦29,556 | ₦46,269 |

9.2.10 Non-Recurrent Land Development Costs: Non-recurrent land development costs are shown in Table No. 9.10. For information the costs of flood protection dykes, divisions and cut-offs, amounting to ₦1.323 million are shown, but as these are considered to be basic infrastructural costs, and not related directly to the project, they are not included in the totals. Negative (i.e. bracketed) figures in this table reflect the sale of surplus equipment.

9.2.11 Recurrent Agricultural Capital Costs: The summary of capital costs for recurrent agricultural operations, which are detailed in the tables to Chapter V, are shown in Table No. 9.11.

9.2.12 Manufacturing Capital Costs: All capital costs relating to the factory and refinery are shown in Table No. 9.12. The list of plant items, discussed in Chapter VII, is shown in Appendix No. 5 in Volume No. III.

9.2.13 Other Capital Costs: All other capital costs directly relating to the sugar project are shown in Table No. 9.13 in which certain infrastructure costs, (being labour housing, the access road from Mokwa to the factory and a proportion of the down-payment for civil costs relating to them) amounting to ₦12.463 million, are shown for information, but excluded from the totals.

9.2.14 Depreciation and Amortization: The summary of the depreciation and amortization calculations is shown in Table No. 9.14. The calculations have been based on estimated working lives of individual equipment items, and will differ from the capital allowances which will be used for taxation purposes.

9.2.15 Finance for Capital Expenditures: It is assumed that supplier credits will be obtained for off-shore equipment on favourable terms. Table No. 9.15 shows the drawdown of credits and payments on contract and shipment, assuming that 85% of the off-shore capital costs will be financed in this way. The table has been divided into Phase 1 and Phase 2, splitting the phases at the end of 1980, and it should be noted that in this split, ₦2.3 million of capital costs applicable to Phase 2 are actually shown in Phase 1. All direct payments are shown as local costs, since they will have to be financed

from the pool of equity and borrowings other than suppliers credits.

9.2.16 Borrowings and Interest Payable: The repayment terms assumed for the suppliers credit are eight years from commissioning for factory equipment, and five years starting six months from the mean date of shipment for agricultural equipment. An interest rate of 7% is used in both cases. Other borrowings are drawn down as required, and repaid as cash becomes available (a nil dividend payout is assumed for this purpose), and bear an interest rate of 9½%. Both principal movements on the loan accounts and interest payable are shown in Table No. 9.16.

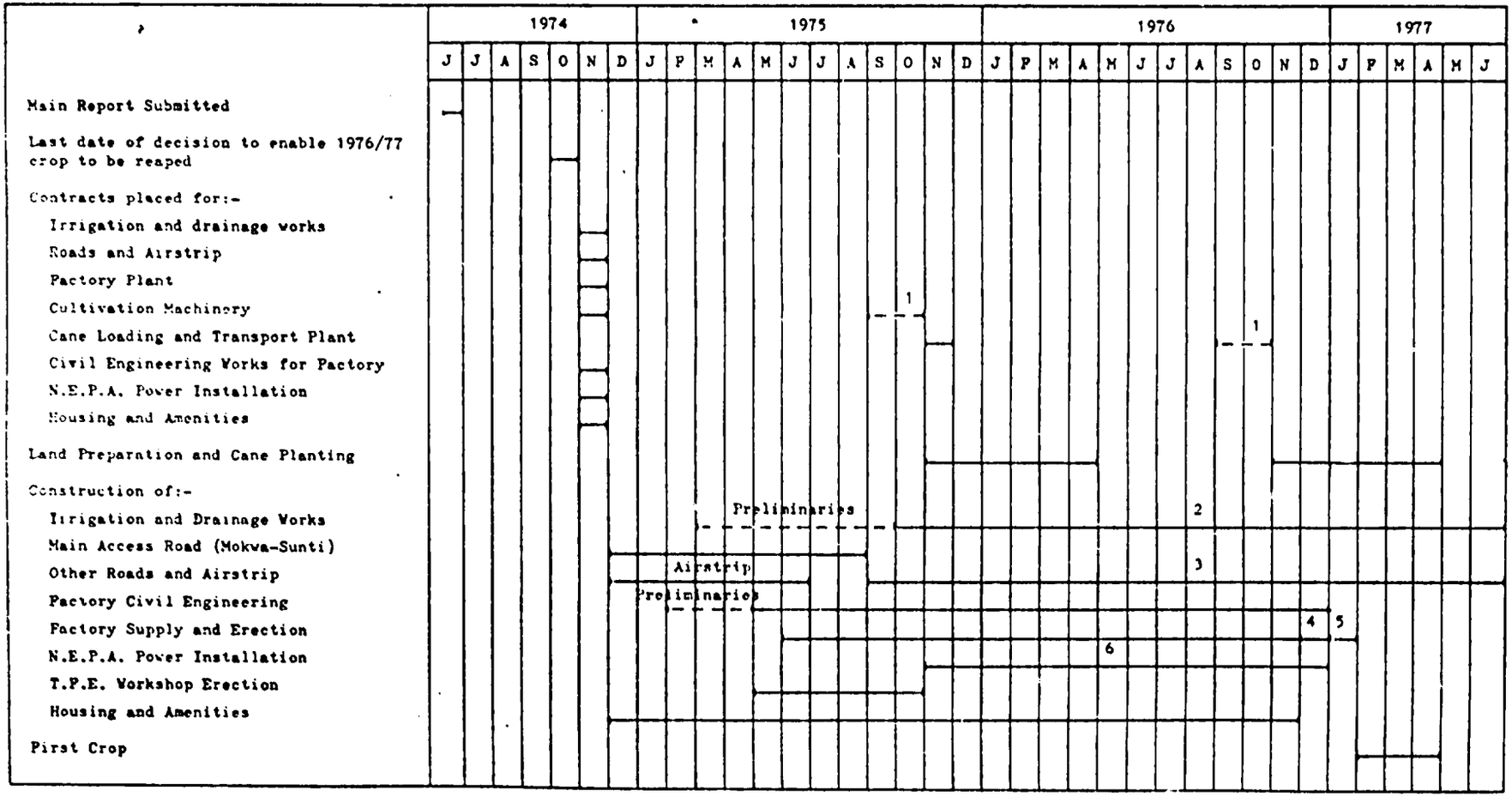
9.2.17 Working Capital: Working capital requirements are shown in Table No. 9.17. The figures for factory and agricultural spares and materials are assessments of the amounts which will be required, bearing in mind the location of and the time required to transport goods to the site. Current liabilities are calculated at one month's operating costs.

## 9.3 COMPANY STRUCTURE

9.3.1 It is not the purpose of this report to discuss the composition and spheres of activity of the Board of Directors of the company, but to recommend the management requirements for the control of the project, both during the development and normal operational phases. The Sunti Sugar Co. Ltd. will be responsible for the setting up and operation of the agricultural and industrial facilities including land development, cultivation, harvesting and transport, the factory and machinery maintenance facility, together with irrigation, drainage and flood protection works for the whole project area. In addition it will assist, as discussed in Chapter VI, in establishing and rendering technical assistance including cane loading and transport for the outgrowers (cane farmers) scheme.

9.3.2 The management staff organisation chart is presented in Table No. 9.19, from which it will be seen that the structure divides into three sections; administration, cultivation and factory. The staff requirement for these departments is shown in Table Nos. 9.20 to 9.26. The staff and labour complements by yearly requirements are tabled in the following:-

## TIME CHART SCHEME




1. Machinery Delivered
2. Completed by October 1981
3. Completed by October 1981
4. Factory Completed December 1976
5. Factory Machinery and Steam Trials November 1976 to January 1977
6. N.E.P.A. Power to Factory Area

Tate & Lyle Technical Services Ltd.

Table No. 2.1

**ANNEX 12:** National Case Study: SUNTI SUGAR PROJECT
Solution Set

Schedule 10-1/2. Fixed investment costs (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1. Land | I | 100 | | | | | | | | | | | |
| local | I | 100 | | | | | | | | | | | |
| foreign | I | | | | | | | | | | | | |
| | I | | | | | | | | | | | | |
| 2. Site preparation and development | I | 159 | 1919 | 2328 | 1158 | 855 | 624 | 1068 | 420 | 82 | 0 | -21 | 0 |
| | I | | | | | | | | | | | | |
| local | I | 1 | 1119 | 1270 | 523 | 668 | 576 | 729 | 235 | 91 | | | |
| foreign | I | 158 | 800 | 1058 | 635 | 187 | 48 | 339 | 185 | -9 | | -21 | |
| | I | | | | | | | | | | | | |
| Flood protection | I | 0 | 740 | 1276 | 166 | 65 | 54 | 222 | 0 | 0 | 0 | 0 | 0 |
| local (75%) | I | | 555 | 957 | 125 | 49 | 41 | 167 | | | | | |
| foreign(25% | I | | 185 | 319 | 42 | 16 | 14 | 56 | | | | | |
| | I | | | | | | | | | | | | |
| 3. Structures and civil work | I | 20 | 10383 | 2490 | 536 | 538 | 361 | 675 | 283 | 6 | 14 | 121 | 104 |
| | I | | | | | | | | | | | | |
| local | I | | 6077 | 1752 | 360 | 387 | 283 | 282 | 168 | | | | |
| foreign | I | 20 | 4306 | 738 | 176 | 151 | 78 | 393 | 115 | 6 | 14 | 121 | 104 |
| | I | | | | | | | | | | | | |
| 4. Agricultural operations | I | 13 | 791 | 1321 | 634 | 471 | 540 | 1046 | 502 | 266 | 248 | 521 | 243 |
| | I | | | | | | | | | | | | |
| local | I | | 158 | 26 | | | | | | | | | |
| foreign | I | 13 | 633 | 1295 | 634 | 471 | 540 | 1046 | 502 | 266 | 248 | 521 | 243 |
| | I | | | | | | | | | | | | |
| 5. Plant and machinery | I | 0 | 7329 | 7006 | 0 | 1530 | 510 | 260 | 250 | 0 | 0 | 0 | 0 |
| | I | | | | | | | | | | | | |
| local | I | | 1828 | 1515 | | | | | | | | | |
| foreign | I | | 5501 | 5491 | | 1530 | 510 | 260 | 250 | | | | |
| Fixed invest.costs | I | 292 | 21162 | 14421 | 2494 | 3459 | 2089 | 3271 | 1455 | 354 | 262 | 621 | 347 |
| | | | | | | | | | | | | | |
| local | I | 101 | 9737 | 5520 | 1008 | 1104 | 900 | 1178 | 403 | 91 | 0 | 0 | 0 |
| foreign | I | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 |

Schedule 10-3/1 agri:
Annual Production Cost Estimate for agricultural, irrigation & drainage operating costs (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Cane production (t) | I | | | | 85254 | 171678 | 255823 | 336174 | 408272 | 454524 | 503489 | 503071 | 499290 |
| Materials: | I | | | | | | | | | | | | |
| Maintenance-Mater. | I | | 2 | 26 | 51 | 56 | 83 | 96 | 100 | 103 | 102 | 98 | 78 |
| Workshop Materials | I | | 14 | 59 | 141 | 164 | 183 | 198 | 249 | 254 | 247 | 222 | 223 |
| | I | | | | | | | | | | | | |
| Labour: | I | | | | | | | | | | | | |
| Skilled: | I | | | | | | | | | | | | |
| TFE Extern. Serv | I | | | 38 | 60 | 84 | 84 | 84 | 84 | 84 | 84 | 84 | 84 |
| TFE Workshop | I | | 6 | 24 | 57 | 68 | 75 | 81 | 102 | 104 | 102 | 92 | 92 |
| Maintenance | I | | 14 | 44 | 71 | 89 | 116 | 135 | 146 | 150 | 150 | 148 | 139 |
| Unskilled: | I | | | | | | | | | | | | |
| Cultivation | I | 2 | 26 | 266 | 433 | 589 | 745 | 912 | 797 | 1102 | 1059 | 1048 | 1042 |
| Harvesting | I | | | | 70 | 140 | 209 | 274 | 333 | 371 | 411 | 410 | 407 |
| | I | | | | | | | | | | | | |
| Running costs: | I | | | | | | | | | | | | |
| Diesel | I | 1 | 7 | 67 | 142 | 142 | 142 | 142 | 142 | 142 | 135 | 67 | |
| Electricity | I | | | | | 55 | 109 | 165 | 193 | 221 | 227 | 282 | 337 |
| | I | | | | | | | | | | | | |
| Transport: | I | | | | | | | | | | | | |
| Harvesting | I | | | | 70 | 140 | 209 | 274 | 333 | 371 | 411 | 410 | 407 |
| | I | | | | | | | | | | | | |
| Administration | I | | | | | | | | | | | | |
| overheads: | I | | 85 | 228 | 317 | 349 | 384 | 384 | 385 | 385 | 384 | 384 | 384 |
| Operating costs | I | 3 | 154 | 752 | 1411 | 1876 | 2338 | 2745 | 2864 | 3286 | 3311 | 3245 | 3193 |

Schedule 10-3/1 fact: Annual Production Cost Estimate for Factory Operating Costs (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Cane production (t) | I | | | | 85254 | 171678 | 255823 | 336174 | 408272 | 454524 | 503489 | 503071 | 499290 |
| Nominal t sugar prod | I | | | | 8525 | 17168 | 25582 | 33617 | 40827 | 45452 | 50349 | 50307 | 49929 |
| Production factor | I | | | | 95 | 95 | 96 | 97 | 98 | 99 | 100 | 100 | 100 |
| Actual t sugar made | I | | | | 8099 | 16309 | 24559 | 32609 | 40011 | 44998 | 50349 | 50307 | 49929 |
| Materials: | I | | | | | | | | | | | | |
| Chemicals | I | | | | 27 | 35 | 44 | 52 | 59 | 65 | 69 | 69 | 68 |
| Materials | I | | | | 134 | 166 | 169 | 205 | 257 | 272 | 287 | 302 | 317 |
| | I | | | | | | | | | | | | |
| Labour: | I | | | | | | | | | | | | |
| Staff | I | | | 175 | 500 | 487 | 480 | 479 | 475 | 471 | 465 | 468 | 449 |
| Clerks, Artisans | I | | | 27 | 107 | 108 | 108 | 118 | 118 | 118 | 118 | 118 | 118 |
| Maintenance | I | | | | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| seasonal labour | I | | | | 5 | 9 | 12 | 14 | 17 | 17 | 17 | 18 | 18 |
| | I | | | | | | | | | | | | |
| Running costs: | I | | | | | | | | | | | | |
| Fuel Oil | I | | | 17 | 29 | 36 | 39 | 43 | 70 | 62 | 58 | 60 | 62 |
| Diesel | I | | | 6 | 26 | 25 | 14 | 13 | 16 | 14 | 12 | 13 | 13 |
| | I | | | | | | | | | | | | |
| Handling, Transport: | I | | | | | | | | | | | | |
| Bagasse | I | | | | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 |
| Muds | I | | | | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| Molasses | I | | | | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| Operating costs | I | 0 | 0 | 225 | 893 | 931 | 952 | 990 | 1078 | 1085 | 1092 | 1114 | 1111 |

Schedule 10-3/1 refin.:
Annual Production Cost Estimate fpr Refinery, Packing & Warehousing Operating Costs (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | Full capacity | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Actual t sugar made | I | | | | 8099 | 16309 | 24559 | 32609 | 40011 | 44998 | 50349 | 50307 | 49929 |
| Materials: | I | | | | | | | | | | | | |
| Chemicals | I | | | | 32 | 63 | 94 | 122 | 148 | 165 | 182 | 182 | 180 |
| Maintenance Mater. | I | | | | 30 | 42 | 48 | 54 | 60 | 60 | 60 | 60 | 60 |
| Packaging Mater. | I | | | | 137 | 276 | 411 | 540 | 656 | 730 | 809 | 808 | 803 |
| | I | | | | | | | | | | | | |
| Labour: | I | | | | | | | | | | | | |
| Staff | I | | | 43 | 115 | 118 | 102 | 104 | 109 | 110 | 111 | 105 | 105 |
| Clerks, Artisans | I | | | 4 | 18 | 18 | 18 | 18 | 20 | 20 | 20 | 20 | 20 |
| seasonal labour | I | | | | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 |
| | I | | | | | | | | | | | | |
| Running costs: | I | | | | | | | | | | | | |
| Fuel Oil | I | | | 6 | 9 | 12 | 13 | 14 | 23 | 21 | 19 | 20 | 20 |
| Diesel | I | | | | 8 | 7 | 4 | 4 | 6 | 6 | 5 | 5 | 6 |
| Operating costs | I | 0 | 0 | 53 | 350 | 538 | 692 | 859 | 1025 | 1115 | 1209 | 1204 | 1198 |

(5)

Schedule 10-3/ladmin.: Annual Cost Estimate for Administration, Housing, Roads & Sundry Costs (in 1000 N)

| Period: | Construction Period | | | Start - up | | | Full capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Labour: | | | | | | | | | | | | |
| in SUNTI: | | | | | | | | | | | | |
| Staff | | 111 | 287 | 289 | 277 | 266 | 262 | 243 | 242 | 242 | 242 | 242 |
| Skilled | | 19 | 41 | 84 | 84 | 84 | 84 | 84 | 84 | 84 | 84 | 84 |
| Unskilled | | 32 | 12 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 |
| in MOKWA: | | | | | | | | | | | | |
| Staff | | 8 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| Skilled | | 5 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| Unskilled | | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| in LAGOS: | | | | | | | | | | | | |
| Staff | | 6 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| Skilled | | 4 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| Unskilled | | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Transport of Equipment & operating: | | 8 | 52 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Maintenance: | | | | | | | | | | | | |
| in SUNTI: | | | | | | | | | | | | |
| General Mainten. | | 197 | 305 | 324 | 360 | 370 | 398 | 403 | 404 | 404 | 404 | 403 |
| Electr.Distr.Maint | | 20 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| in MOKWA: | | | | | | | | | | | | |
| General Mainten. | | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| in LAGOS: | | | | | | | | | | | | |
| General Mainten. | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Overheads: | | | | | | | | | | | | |
| Staff Training | | | 100 | 100 | 100 | 100 | 100 | | | | | |
| Insurance | 1 | 47 | 82 | 93 | 107 | 112 | 119 | 123 | 124 | 125 | 127 | 128 |
| Technical Services | | | | 15 | 30 | 15 | | | | | | |
| T o t a l | 1 | 464 | 977 | 1111 | 1164 | 1153 | 1169 | 1059 | 1060 | 1061 | 1063 | 1063 |

Schedule 10-3/1fc: Annual Factory Cost Estimate (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | | Full capacity | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Materials: | I | | | | | | | | | | | | |
| Agriculture | I | | 16 | 85 | 192 | 220 | 266 | 294 | 349 | 357 | 349 | 320 | 301 |
| Factory | I | | | | 161 | 201 | 233 | 257 | 316 | 337 | 356 | 371 | 385 |
| Refinery | I | | | | 199 | 381 | 553 | 716 | 864 | 955 | 1051 | 1050 | 1043 |
| | I | | | | | | | | | | | | |
| Labour: | I | | | | | | | | | | | | |
| Staff: | I | | | | | | | | | | | | |
| Agriculture | I | | | | | | | | | | | | |
| Factory | I | | | 175 | 500 | 487 | 480 | 479 | 475 | 471 | 465 | 468 | 449 |
| Refinery | I | | | 43 | 115 | 118 | 102 | 104 | 109 | 110 | 111 | 105 | 105 |
| Skilled: | I | | | | | | | | | | | | |
| Agriculture | I | | 20 | 106 | 188 | 241 | 275 | 300 | 332 | 338 | 336 | 324 | 315 |
| Factory | I | | | 27 | 114 | 115 | 116 | 126 | 126 | 126 | 126 | 126 | 126 |
| Refinery | I | | | 4 | 18 | 18 | 18 | 18 | 20 | 20 | 20 | 20 | 20 |
| Unskilled: | I | | | | | | | | | | | | |
| Agriculture | I | 2 | 26 | 266 | 503 | 729 | 954 | 1186 | 1130 | 1473 | 1470 | 1458 | 1449 |
| Factory | I | | | | 5 | 9 | 12 | 14 | 17 | 17 | 17 | 18 | 18 |
| Refinery | I | | | | 1 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 |
| | I | | | | | | | | | | | | |
| Running costs: | I | | | | | | | | | | | | |
| Agriculture | I | 1 | 7 | 67 | 142 | 197 | 251 | 307 | 335 | 363 | 362 | 349 | 337 |
| Factory | I | | | 23 | 55 | 61 | 53 | 56 | 86 | 76 | 70 | 73 | 75 |
| Refinery | I | | | 6 | 17 | 19 | 17 | 18 | 29 | 27 | 24 | 25 | 26 |
| | I | | | | | | | | | | | | |
| Transport: | I | | | | | | | | | | | | |
| Agriculture | I | | | | 70 | 140 | 209 | 274 | 333 | 371 | 411 | 410 | 407 |
| Factory | I | | | | 58 | 58 | 58 | 58 | 58 | 58 | 58 | 58 | 58 |
| Factory costs | I | 3 | 69 | 802 | 2338 | 2996 | 3599 | 4210 | 4582 | 5102 | 5229 | 5179 | 5118 |

(8)

(7) is missing

Schedule 10-3/1: Annual Production Cost Estimate (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Factory costs | I | 3 | 69 | 802 | 2338 | 2996 | 3599 | 4210 | 4582 | 5102 | 5229 | 5179 | 5118 |
| Administ. overheads: | | | | | | | | | | | | | |
| Labour Overhead costs (agricultural administration, SUNTI, MOKWA, LAGOS) | | | | | | | | | | | | | |
| Staff | I | 0 | 167 | 427 | 474 | 478 | 484 | 480 | 462 | 461 | 460 | 460 | 460 |
| Skilled | I | 0 | 58 | 139 | 213 | 224 | 237 | 237 | 237 | 237 | 237 | 237 | 237 |
| Unskilled | I | 0 | 49 | 54 | 86 | 91 | 96 | 96 | 97 | 97 | 96 | 96 | 96 |
| Labour Overheads: | I | 0 | 273 | 620 | 773 | 793 | 817 | 813 | 795 | 794 | 793 | 793 | 793 |
| Transport: | I | | 8 | 52 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 |
| Maintenance: | I | | 221 | 351 | 370 | 406 | 416 | 444 | 449 | 450 | 450 | 450 | 449 |
| Sundries: | I | 1 | 47 | 182 | 208 | 237 | 227 | 219 | 123 | 124 | 125 | 127 | 128 |
| Total Admin.Overhead | I | 1 | 549 | 1205 | 1428 | 1513 | 1537 | 1553 | 1444 | 1445 | 1445 | 1447 | 1447 |
| Operating costs: | I | 4 | 618 | 2007 | 3766 | 4509 | 5136 | 5763 | 6026 | 6547 | 6674 | 6626 | 6565 |
| Financial costs | I | | | | | | | | | | | | |
| (interests) | I | 14 | 620 | 1386 | 1841 | 2222 | 2627 | 2932 | 2979 | 2848 | 2532 | 2131 | 1675 |
| Depreciation | I | 26 | 342 | 1255 | 1339 | 1483 | 1575 | 1719 | 1754 | 1763 | 1743 | 1701 | 1600 |
| TOTAL Product.Costs: | I | 44 | 1580 | 4648 | 6946 | 8214 | 9338 | 10414 | 10759 | 11158 | 10949 | 10458 | 9840 |

Schedule 10-3/2: Calculation of Working Capital (in 1000 N)

| Period: | I | | I | Construct. Peri | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I X | Y | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| I. Current assets: | I | | I | | | | | | | | | | | | |
| A. Accounts receiv | I 30 | 12 | I | 0 | 52 | 167 | 314 | 376 | 428 | 480 | 502 | 546 | 556 | 552 | 547 |
| | I | | I | | | | | | | | | | | | |
| B. Inventory | I | | I | | | | | | | | | | | | |
| (a)Materials: | I | | I | | | | | | | | | | | | |
| Workshop mater. | I 60 | 6 | I | | 2 | 10 | 24 | 27 | 31 | 33 | 42 | 42 | 41 | 37 | 37 |
| Chemicals (imp.) | I 100 | 3.60 | I | | | | 16 | 27 | 38 | 48 | 58 | 64 | 70 | 70 | 69 |
| Other materials | I 30 | 12 | I | | | | 23 | 37 | 50 | 62 | 76 | 84 | 91 | 93 | 93 |
| (b)Spare parts: | I 180 | 2 | I | | 1 | 13 | 41 | 49 | 66 | 75 | 80 | 82 | 81 | 79 | 69 |
| (c)Work-in-progr | I 9 | 40 | I | 0 | 2 | 20 | 58 | 75 | 90 | 105 | 115 | 128 | 131 | 129 | 128 |
| (d)Finished prod | I 15 | 24 | I | 0 | 26 | 84 | 157 | 188 | 214 | 240 | 251 | 273 | 278 | 276 | 274 |
| | I | | I | | | | | | | | | | | | |
| C. Cash in Hand | I 15 | 24 | I | 1 | 51 | 138 | 211 | 247 | 280 | 310 | 312 | 323 | 310 | 292 | 271 |
| D. Current assets: | I | | I | 1 | 133 | 432 | 843 | 1026 | 1196 | 1354 | 1434 | 1540 | 1559 | 1528 | 1488 |
| | I | | I | | | | | | | | | | | | |
| II. Current liabilit | I | | I | | | | | | | | | | | | |
| A. Accounts payabl | I 30 | 12 | I | | 1 | 7 | 46 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144 |
| III. Working capital: | | | I | | | | | | | | | | | | |
| A. Net working capital | | | I | 1 | 132 | 425 | 797 | 959 | 1108 | 1248 | 1307 | 1402 | 1412 | 1383 | 1344 |
| B. Increase in working capital | | | I | 1 | 131 | 293 | 372 | 162 | 149 | 140 | 59 | | 10 | -29 | -39 |

The cash balance schedule is based on the following calculation:

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IV. Total product.costs | I | 44 | 1580 | 4648 | 6946 | 8214 | 9338 | 10414 | 10759 | 11158 | 10949 | 10458 | 9840 |
| less: Materials | I | | 16 | 85 | 552 | 802 | 1052 | 1267 | 1529 | 1649 | 1756 | 1741 | 1729 |
| Depreciation | I | 26 | 342 | 1255 | 1339 | 1483 | 1575 | 1719 | 1754 | 1763 | 1743 | 1701 | 1600 |
| I 15 | 24 I | 18 | 1222 | 3308 | 5055 | 5929 | 6711 | 7428 | 7476 | 7746 | 7450 | 7016 | 6511 |
| V. Required cash balance: | I | 1 | 51 | 138 | 211 | 247 | 280 | 310 | 312 | 323 | 310 | 292 | 271 |

Schedule 10-6/2: Total investment costs (in 1000 N)

| Period: | Construction Per | | | Start - up | | | | | | Full capacity | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 1. Fixed investment: | | | | | | | | | | | | | |
| (a) Initial fixed | 292 | 21162 | 14421 | 2494 | 3459 | 2089 | 3271 | 1455 | 354 | 262 | 621 | 347 | 50227 |
| local | 101 | 9737 | 5520 | 1008 | 1104 | 900 | 1178 | 403 | 91 | 0 | 0 | 0 | 20040 |
| foreign | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 | 30187 |
| (b) Replacements | 0 | 0 | 0 | 3 | 0 | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| local | | | | 3 | | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| foreign | | | | | | | | | | | | | 0 |
| 2. Pre-production: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| local | | | | | | | | | | | | | 0 |
| foreign | | | | | | | | | | | | | 0 |
| 3. Working capital increase: | 1 | 131 | 293 | 372 | 162 | 149 | 140 | 59 | 95 | 10 | -29 | -39 | 1344 |
| local | 1 | 131 | 293 | 372 | 162 | 149 | 140 | 59 | 95 | 10 | -29 | -39 | 1344 |
| foreign | | | | | | | | | | | | | 0 |
| Total investm. costs | 293 | 21293 | 14714 | 2869 | 3621 | 2260 | 3631 | 1905 | 503 | 534 | 1087 | 655 | 53365 |
| local | 102 | 9868 | 5813 | 1383 | 1266 | 1071 | 1537 | 853 | 240 | 272 | 466 | 308 | 23178 |
| foreign | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 | 30187 |

Schedule 10-7/2: Total assets (in 1000 N)

| Period: | Construction Per. | | | Start - up | | | | | | Full capacity | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 1. Fixed investment: | | | | | | | | | | | | | |
| (a) Initial fixed | 292 | 21162 | 14421 | 2494 | 3459 | 2089 | 3271 | 1455 | 354 | 262 | 621 | 347 | 50227 |
| local | 101 | 9737 | 5520 | 1008 | 1104 | 900 | 1178 | 403 | 91 | 0 | 0 | 0 | 20040 |
| foreign | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 | 30187 |
| (b) Replacements | 0 | 0 | 0 | 3 | 0 | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| local | | | | 3 | | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| foreign | | | | | | | | | | | | | 0 |
| 2. Pre-production: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| local | | | | | | | | | | | | | 0 |
| foreign | | | | | | | | | | | | | 0 |
| 3. Current assets increase: | 1 | 132 | 298 | 411 | 183 | 170 | 158 | 81 | 105 | 19 | -30 | -40 | 1488 |
| local | 1 | 131 | 293 | 372 | 162 | 149 | 140 | 59 | 95 | 10 | -29 | -39 | 1344 |
| foreign | | 1 | 6 | 39 | 21 | 21 | 18 | 22 | 10 | 9 | -1 | -1 | 144 |
| Total assets: | 293 | 21294 | 14719 | 2908 | 3642 | 2281 | 3649 | 1927 | 513 | 543 | 1086 | 654 | 53509 |
| local | 102 | 9868 | 5813 | 1383 | 1266 | 1071 | 1537 | 853 | 240 | 272 | 466 | 308 | 23178 |
| foreign | 191 | 11426 | 8907 | 1525 | 2376 | 1210 | 2111 | 1074 | 273 | 271 | 620 | 346 | 30331 |

Schedule 10-8/1: Source of finance (in 1000 N)

| Source of finance: | Local currency | Foreign currency | Total: | Conditions: |
|---|---|---|---|---|
| 1. Promoters: | | | | |
| (a) Equity | 5000 | | 5000 | annual dividend of 8 % |
| (b) Loans | | | | |
| 2. Collaborators: | | | | |
| (a) Equity | 3000 | | 3000 | annual dividend of 8 % |
| (b) Loans | | | | |
| 3. Financial institutions or development agencies | | | | |
| National Developm. Bank | | | | 5 % interest, repayment in 10 equal |
| (a) Equity | | | | annuities, 4 years' of grace, pro- |
| (b) Loans | 15000 | | 15000 | cessing fee: 2 % |
| International Development agencie | | | | 6 % interest, repayment in 15 equal |
| (a) Equity | | | | annuities, 6 years' of grace, pro- |
| (b) Loans | | 20000 | 20000 | cessing fee: 3 % |
| 4. Government: | | | | |
| (a) Equity | | | | |
| (b) Loans | | | | |
| (c) Subsidy | | | | |
| 5. Commercial Banks: | | | | annual dividend of 8 % for equity, loans |
| (a) Equity | 5000 | | 5000 | possible up to 3000, 12 % interest |
| (b) Loans | | | | |
| 6. Supplier's credits: | | 10000 | 10000 | 10 % interest, repayment of 2000 p.a., beginning with the 1st year of production |
| TOTAL: | 28000 | 30000 | 58000 | |

Schedule 10-8/2: Sources of initial funds (in 1000 N)

| Period: | Construction Pe | | | Start - up | | | Full capacity | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total: |
| Equity capital: | | | | | | | | | | | | | |
| local | | 13000 | | | | | | | | | | | 13000 |
| Loans: | | | | | | | | | | | | | |
| local | | 15000 | | | | | | | | | | | 15000 |
| foreign | | | 10000 | 10000 | | | | | | | | | 20000 |
| Suppliers' credit | | | 10000 | | | | | | | | | | 10000 |
| foreign | | | | | | | | | | | | | |
| Current liabilities: | | 1 | 7 | 46 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144 | |
| Total | | 28001 | 20007 | 10046 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144 | 58000 |

Repayment Schedule 1 (in 1000 N)

| National Development Bank Loan: 15000 | | International Development Agencie Loan: | | | Supplier's credit: 10000 | |
|---|---|---|---|---|---|---|
| Loan: | 15000 | Loan: | 10000 | 20000 | interest rate in % : | 10 |
| + 2 % processing fee | 15300 | + 3 % processing fee | 10300 | 20600 | | |
| | | | | | equal annuity: | 2000 |
| interest rate in % : | 5 | interest rate in % : | 6 | 6 | (repayment beginning with | |
| debt after year 1: | 16065 | debt after year 1: | 10918 | 21836 | the first year of production) | |
| year 2: | 16868 | year 2: | 11573 | 23146 | | |
| year 3: | 17712 | year 3: | 12267 | 24535 | debt after year 1: | 11000 |
| year 4: | 18597 | year 4: | 13004 | 26007 | year 2: | 12100 |
| year 5: | 19527 | year 5: | 13784 | 27567 | | |
| | | year 6: | 14611 | 29221 | remaining debt after | |
| 10 equal annuit. of: | 2408 | year 7: | 15487 | 30975 | repayment year 1: | 11110 |
| | | | | | year 2: | 10021 |
| | | 10 equal annuit. of: | 1504 | 3009 | year 3: | 8823 |
| remaining debt after | | remaining debt after | | | year 4: | 7505 |
| repayment: year 1: | 17975 | repayment: year 1: | 14822 | 29644 | year 5: | 6056 |
| year 2: | 16344 | year 2: | 14117 | 28233 | year 6: | 4462 |
| year 3: | 14633 | year 3: | 13369 | 26738 | year 7: | 2708 |
| year 4: | 12836 | year 4: | 12577 | 25153 | year 8: | 778 |
| year 5: | 10949 | year 5: | 11737 | 23473 | | |
| year 6: | 8967 | year 6: | 10846 | 21692 | | |
| year 7: | 6887 | year 7: | 9902 | 19805 | | |
| year 8: | 4702 | year 8: | 8902 | 17804 | | |
| year 9: | 2408 | year 9: | 7841 | 15683 | | |
| year 10: | 0 | year 10: | 6717 | 13434 | | |
| | | year 11: | 5526 | 11051 | | |
| | | year 12: | 4262 | 8525 | | |
| | | year 13: | 2924 | 5847 | | |
| | | year 14: | 1504 | 3009 | | |
| | | year 15: | 0 | 0 | | |

Repayment Schedule 2, Annuities, Interests and Amortizations (in 1000 N)

(15)

| Period: | I | Construction Peri | | | Start - up | | | | | | Full capacity | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| Annuities: | I | | | | | | | | | | | | | |
| Loans: | I | | | | | | | | | | | | | |
| local | I | | | | | | | 2408 | 2408 | 2408 | 2408 | 2408 | 2408 | ..... |
| foreign 1st share | I | | | | | | | | | 1504 | 1504 | 1504 | 1504 | ..... |
| foreign 2nd share | I | | | | | | | | | | 1504 | 1504 | 1504 | ..... |
| Suppliers' credit | I | | | | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | 778 | | |
| T o t a l | I | 0 | 0 | 0 | 2000 | 2000 | 2000 | 4408 | 4408 | 5913 | 7417 | 6196 | 5417 | ..... |
| | | initial | | | | | | | | | | | | |
| Interests: | I | debt: | interest: (%) | | | | | | | | | | | |
| Loans: | I | | | | | | | | | | | | | |
| local | I | 19527 | 5 | | | | | 856 | 778 | 697 | 611 | 521 | 427 | ..... |
| foreign 1st share | I | 15487 | 6 | | | | | | | 839 | 799 | 757 | 712 | ..... |
| foreign 2nd share | I | 15487 | 6 | | | | | | | | 839 | 799 | 757 | ..... |
| Suppliers' credit | I | 12100 | 10 | | 1010 | 911 | 802 | 682 | 551 | 406 | 246 | 71 | | |
| T o t a l | I | | | 0 | 1010 | 911 | 802 | 1538 | 1329 | 1941 | 2495 | 2148 | 1896 | ..... |
| | | Local loan: | | | remaining debt: | | | 17975 | 16344 | 14633 | 12836 | 10949 | 8967 | ..... |
| | | Foreign 1st share: | | | remaining debt: | | | | | 14822 | 14117 | 13369 | 12577 | ..... |
| | | Foreign 2nd share: | | | remaining debt: | | | | | | 14822 | 14117 | 13369 | ..... |
| | | Suppliers'credit: | | | 11110 | 10021 | 8823 | 7505 | 6056 | 4462 | 2708 | 778 | | |
| Amortizations: | I | | | | | | | | | | | | | |
| Loans: | I | | | | | | | | | | | | | |
| local | I | | | | | | | 1552 | 1630 | 1712 | 1797 | 1887 | 1981 | ..... |
| foreign 1st share | I | | | | | | | | | 665 | 705 | 748 | 792 | ..... |
| foreign 2nd share | I | | | | | | | | | | 665 | 705 | 748 | ..... |
| Suppliers' credit | I | | | | 990 | 1089 | 1198 | 1318 | 1449 | 1594 | 1754 | 708 | | |
| T o t a l | I | | | 0 | 990 | 1089 | 1198 | 2870 | 3080 | 3971 | 4922 | 4048 | 3522 | |

Schedule 3-1: Estimate of Sales (in tonnes) and revenues (in 1000 N)

| Period: | I | Construction Per. | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Sales: | I | | | | | | | | | | | | |
| Bagged sugar | I | | | | 8099 | 9785 | 14735 | 19565 | 24005 | 26998 | 30209 | 30184 | 29957 |
| Prepacked sugar | I | | | | | 6524 | 9823 | 13043 | 16004 | 17999 | 20140 | 20123 | 19971 |
| T o t a l sugar: | I | | | | 8099 | 16309 | 24558 | 32608 | 40009 | 44997 | 50349 | 50307 | 49928 |
| | I | | | | | | | | | | | | |
| Molasses | I | | | | 2430 | 4893 | 7367 | 9782 | 12002 | 13499 | 15105 | 15092 | 14978 |

| Revenues: | Bagged sugar is thought to be sold at: 270 N/tonne<br>Prepacked sugar is thought to be sold at 300 N/tonne | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bagged sugar | I | | | | 2187 | 2642 | 3978 | 5283 | 6481 | 7289 | 8156 | 8150 | 8088 |
| Prepacked sugar | I | | | | 0 | 1957 | 2947 | 3913 | 4801 | 5400 | 6042 | 6037 | 5991 |
| T o t a l sugar: | I | | | | 2187 | 4599 | 6925 | 9195 | 11283 | 12689 | 14198 | 14187 | 14080 |
| | I | | | | | | | | | | | | |
| Molasses | I | | | | 19 | 38 | 74 | 106 | 135 | 154 | 175 | 175 | 174 |
| T o t a l Revenue: | I | | | | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254 |

Schdeule 10-12: Production -cost schedule (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Production factor %: | I | | | | 95 | 95 | 96 | 97 | 98 | 99 | 100 | 100 | 100 |
| 1. Direct materials | I | 1 | 23 | 181 | 766 | 1079 | 1373 | 1648 | 1979 | 2115 | 2212 | 2188 | 2167 |
| 2. Direct manpower | I | 2 | 46 | 621 | 1444 | 1719 | 1959 | 2230 | 2212 | 2558 | 2548 | 2523 | 2486 |
| 3. Factory overheads | I | | | | 128 | 198 | 267 | 332 | 391 | 429 | 469 | 468 | 465 |
| Factory costs | I | 3 | 69 | 802 | 2338 | 2996 | 3599 | 4210 | 4582 | 5102 | 5229 | 5179 | 5118 |
| 4. Administrat.costs | I | 0 | 273 | 620 | 773 | 793 | 817 | 813 | 795 | 794 | 793 | 793 | 793 |
| 5. Trans.,Main.,Sund | I | 1 | 276 | 585 | 655 | 720 | 720 | 740 | 649 | 651 | 652 | 654 | 654 |
| Operating costs | I | 4 | 618 | 2007 | 3766 | 4509 | 5136 | 5763 | 6026 | 6547 | 6674 | 6626 | 6565 |
| 6. Financial costs | I | | | 0 | 1010 | 911 | 802 | 1538 | 1329 | 1941 | 2495 | 2148 | 1896 |
| 7. Depreciation | I | 26 | 342 | 1255 | 1339 | 1483 | 1575 | 1719 | 1754 | 1763 | 1743 | 1701 | 1600 |
| Total product. cost | I | 30 | 960 | 3262 | 6115 | 6903 | 7513 | 9020 | 9109 | 10251 | 10912 | 10475 | 10061 |

Schedule 10-3/2re: Revised Calculation of Working Capital (in 1000 N)

| Period: | I | | I | Construct. Peri | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | X | Y I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| I. Current assets: | I | | I | | | | | | | | | | | | |
| A. Accounts receiv | I | 30 | 12 I | 0 | 52 | 167 | 314 | 376 | 428 | 480 | 502 | 546 | 556 | 552 | 547 |
| | I | | I | | | | | | | | | | | | |
| B. Inventory | I | | I | | | | | | | | | | | | |
| (a) Materials: | I | | I | | | | | | | | | | | | |
| Workshop mater. | I | 60 | 6 I | | 2 | 10 | 24 | 27 | 31 | 33 | 42 | 42 | 41 | 37 | 37 |
| Chemicals (imp.) | I | 100 | 3.60 I | | | | 16 | 27 | 38 | 48 | 58 | 64 | 70 | 70 | 69 |
| Other materials | I | 30 | 12 I | | | | 23 | 37 | 50 | 62 | 76 | 84 | 91 | 93 | 93 |
| (b) Spare parts: | I | 180 | 2 I | | 1 | 13 | 41 | 49 | 66 | 75 | 80 | 82 | 81 | 79 | 69 |
| (c) Work-in-progr | I | 9 | 40 I | 0 | 2 | 20 | 58 | 75 | 90 | 105 | 115 | 128 | 131 | 129 | 128 |
| (d) Finished prod | I | 15 | 24 I | 0 | 26 | 84 | 157 | 188 | 214 | 240 | 251 | 273 | 278 | 276 | 274 |
| | I | | I | | | | | | | | | | | | |
| C. Cash in Hand | I | 15 | 24 I | 0 | 25 | 80 | 176 | 192 | 204 | 251 | 243 | 285 | 309 | 293 | 280 |
| D. Current assets: | I | | I | 1 | 107 | 374 | 808 | 971 | 1120 | 1295 | 1366 | 1502 | 1557 | 1529 | 1497 |
| | I | | I | | | | | | | | | | | | |
| II. Current liabilit | I | | I | | | | | | | | | | | | |
| A. Accounts payabl | I | 30 | 12 I | | 1 | 7 | 46 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144 |
| III. Working capital: | | | I | | | | | | | | | | | | |
| A. Net working capital | | | I | 1 | 106 | 367 | 762 | 904 | 1032 | 1190 | 1238 | 1365 | 1411 | 1384 | 1353 |
| B. Increase in working capital | | | I | 1 | 105 | 261 | 395 | 142 | 128 | 158 | 48 | 126 | 46 | -27 | -31 |

The cash balance schedule is based on the following calculation:

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IV. Total product.costs | | | I | 30 | 960 | 3262 | 6115 | 6903 | 7513 | 9020 | 9109 | 10251 | 10912 | 10475 | 10061 |
| less: Materials | | | I | | 16 | 85 | 552 | 802 | 1052 | 1267 | 1529 | 1649 | 1756 | 1741 | 1729 |
| Depreciation | | | I | 26 | 342 | 1255 | 1339 | 1483 | 1575 | 1719 | 1754 | 1763 | 1743 | 1701 | 1600 |
| | I | 15 | 24 I | 4 | 602 | 1922 | 4224 | 4618 | 4886 | 6034 | 5826 | 6839 | 7413 | 7033 | 6732 |
| V. Required cash balance: | | | I | 0 | 25 | 80 | 176 | 192 | 204 | 251 | 243 | 285 | 309 | 293 | 280 |

Schedule 10-6/2re: Revised Total investment costs (in 1000 N)

| Period: | Construction Per | | | Start - up | | | | | | Full capacity | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 1. Fixed investment: | | | | | | | | | | | | | |
| (a) Initial fixed | 292 | 21162 | 14421 | 2494 | 3459 | 2089 | 3271 | 1455 | 354 | 262 | 621 | 347 | 50227 |
| local | 101 | 9737 | 5520 | 1008 | 1104 | 900 | 1178 | 403 | 91 | 0 | 0 | 0 | 20040 |
| foreign | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 | 30187 |
| (b) Replacements | 0 | 0 | 0 | 3 | 0 | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| local | | | | 3 | | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| foreign | | | | | | | | | | | | | 0 |
| 2. Pre-production: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| local | | | | | | | | | | | | | 0 |
| foreign | | | | | | | | | | | | | 0 |
| 3. Working capital increase: | 1 | 105 | 261 | 395 | 142 | 128 | 158 | 48 | 126 | 46 | -27 | -31 | 1353 |
| local | 1 | 105 | 261 | 395 | 142 | 128 | 158 | 48 | 126 | 46 | -27 | -31 | 1353 |
| foreign | | | | | | | | | | | | | 0 |
| Total investm. costs | 293 | 21267 | 14682 | 2892 | 3601 | 2239 | 3649 | 1894 | 534 | 570 | 1089 | 663 | 53374 |
| local | 102 | 9842 | 5781 | 1406 | 1246 | 1049 | 1555 | 842 | 271 | 308 | 468 | 316 | 23188 |
| foreign | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 | 30187 |

Schedule 10-7/2re: Revised Total assets (in 1000 N)

| Period: | Construction Per. | | | Start - up | | | | | | Full capacity | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
| 1. Fixed investment: | | | | | | | | | | | | | |
| (a) Initial fixed | 292 | 21162 | 14421 | 2494 | 3459 | 2089 | 3271 | 1455 | 354 | 262 | 621 | 347 | 50227 |
| local | 101 | 9737 | 5520 | 1008 | 1104 | 900 | 1178 | 403 | 91 | 0 | 0 | 0 | 20040 |
| foreign | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 | 30187 |
| (b) Replacements | 0 | 0 | 0 | 3 | 0 | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| local | | | | 3 | | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| foreign | | | | | | | | | | | | | 0 |
| 2. Pre-production: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| local | | | | | | | | | | | | | 0 |
| foreign | | | | | | | | | | | | | 0 |
| 3. Current assets increase: | 1 | 107 | 266 | 434 | 163 | 149 | 176 | 70 | 136 | 55 | -28 | -32 | 1497 |
| local | 1 | 105 | 261 | 395 | 142 | 128 | 158 | 48 | 126 | 46 | -27 | -31 | 1353 |
| foreign | | 1 | 6 | 39 | 21 | 21 | 18 | 22 | 10 | 9 | -1 | -1 | 144 |
| Total assets: | 293 | 21269 | 14687 | 2931 | 3622 | 2260 | 3667 | 1916 | 544 | 579 | 1088 | 662 | 53518 |
| local | 102 | 9842 | 5781 | 1406 | 1246 | 1049 | 1555 | 842 | 271 | 308 | 468 | 316 | 23188 |
| foreign | 191 | 11426 | 8907 | 1525 | 2376 | 1210 | 2111 | 1074 | 273 | 271 | 620 | 346 | 30331 |

Schedule 10-8/3: Cash-flow table for financial planning (in 1000 N)

| Period: | Construct. Per | | | Start - up | | | | | | Full capacity | | | Salvage value in last year | Total: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12... | | |
| Production factor %: | | | | 95 | 95 | 96 | 97 | 98 | 99 | 100 | 100 | 100... | | |
| A. Cash inflow: | | | | | | | | | | | | | | |
| 1.Financial resources | | 28001 | 20007 | 10046 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144... | | 59015 |
| 2.Sales revenue | | | | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254... | | 90393 |
| | | | | | | | | | | | | | | 0 |
| Total cash inflow: | 0 | 28001 | 20007 | 12252 | 4704 | 7087 | 9407 | 11545 | 12981 | 14520 | 14507 | 14398... | | 149408 |
| B. Cash outflow: | | | | | | | | | | | | | | |
| 1.Total ass.incl.repl | 293 | 21269 | 14687 | 2931 | 3622 | 2260 | 3667 | 1916 | 544 | 579 | 1088 | 662... | 6500 | 60018 |
| 2.Operating costs | 4 | 618 | 2007 | 3766 | 4509 | 5136 | 5763 | 6026 | 6547 | 6674 | 6626 | 6565... | | 54241 |
| 3.Debt service(total) | | | | | | | | | | | | | | |
| (a)Interests: | | | | | | | | | | | | | | |
| Local loan | | | | | | | 856 | 778 | 697 | 611 | 521 | 427... | | 3891 |
| Foreign 1st share | | | | | | | | | 839 | 799 | 757 | 712... | | 3107 |
| Foreign 2nd share | | | | | | | | | | 839 | 799 | 757... | | 2395 |
| Suppliers' credit | | | | 1010 | 911 | 802 | 682 | 551 | 406 | 246 | 71 | | | 4678 |
| (b)Repayments: | | | | | | | | | | | | | | |
| Local loan | | | | | | | 1552 | 1630 | 1712 | 1797 | 1887 | 1981... | | 10560 |
| Foreign 1st share | | | | | | | | | 665 | 705 | 748 | 792... | | 2911 |
| Foreign 2nd share | | | | | | | | | | 665 | 705 | 748... | | 2118 |
| Suppliers' credit | | | | 990 | 1089 | 1198 | 1318 | 1449 | 1594 | 1754 | 708 | | | 10100 |
| 4.Corporate tax: | | | | | | | | | | | | | | |
| 5.Dividends on equity | | | 1040 | 1040 | 1040 | 1040 | 1040 | 1040 | 1040 | 1040 | 1040 | 1040... | | 10400 |
| Total cash outflow: | 297 | 21887 | 17734 | 9737 | 11171 | 10436 | 14878 | 13391 | 14044 | 15710 | 14950 | 13685... | 6500 | 157919 |
| C. Surplus/Deficit | -297 | 6115 | 2273 | 2514 | -6467 | -3349 | -5471 | -1846 | -1064 | -1190 | -443 | 713... | | -8511 |
| D. Cumul. cash balance | -297 | 5818 | 8091 | 10605 | 4138 | 789 | -4682 | -6527 | -7591 | -8781 | -9224 | -8511... | | |

Schedule 10-8/1re: Revised Source of finance (in 1000 N)

| Source of finance: | Local currency | Foreign currency | Total: | Conditions: |
|---|---|---|---|---|
| 1. Promoters: | | | | |
| (a) Equity | 5000 | | 5000 | annual dividend of 8 %, after the 5th year of production |
| (b) Loans | | | | |
| 2. Collaborators: | | | | |
| (a) Equity | 4000 | | 4000 | annual dividend of 8 %, after the 5th year of production |
| (b) Loans | | | | |
| 3. Financial institutions or development agencies | | | | |
| National Developm. Bank | | | | |
| (a) Equity | | | | 5 % interest, repayment in 15 equal annuities, 4 years of grace, processing fee: 2 % |
| (b) Loans | 15000 | | 15000 | |
| International Development agencie | | | | |
| (a) Equity | | | | 6 % interest, repayment in 15 equal annuities, 6 years of grace, processing fee: 3 % |
| (b) Loans | | 20000 | 20000 | |
| 4. Government: | | | | |
| (a) Equity | | | | tax holiday within the first 10 years of production |
| (b) Loans | | | | |
| (c) Subsidy | | | | |
| 5. Commercial Banks. | | | | annual dividend of 8 % for equity after the 5th year of production, loans possible up to 3000, 12 % interest |
| (a) Equity | 5000 | | 5000 | |
| (b) Loans | 500 | | 500 | |
| 6. Supplier's credits: | | 0 | 0 | 10 % interest, repayment of 2000 p.a., beginning with the 1st year of production |
| TOTAL: | 29500 | 20000 | 49500 | |

Schedule 10-8/2re: Revised table of Sources of initial funds (in 1000 N)

| Period: | I | Construction Pe | | | Start - up | | | | | | | | Full capacity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12I | T o t a l: |
| | I | | | | | | | | | | | | I | |
| Equity capital: | I | | | | | | | | | | | | I | 14000 |
| local | I | | 14000 | | | | | | | | | | I | |
| Loans: | I | | | | | | | | | | | | I | 15500 |
| local | I | 500 | 10000 | 5000 | | | | | | | | | I | 20000 |
| foreign | I | | | 10000 | 10000 | | | | | | | | I | 0 |
| Suppliers' credit | I | | | | | | | | | | | | I | |
| foreign | I | | | | | | | | | | | | | |
| Current liabilities: | I | | 1 | 7 | 46 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144I | 1015 |
| T o t a l | I | 500 | 24001 | 15007 | 10046 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144I | 50515 |

Revised Repayment Schedule 1 (in 1000 M)

| National Development Bank Loan: | | | International Development Agencie Loan: | | | Supplier's credit: | 10000 |
|---|---|---|---|---|---|---|---|
| Loan: | 10000 | 5000 | Loan: | 10000 | 20000 | interest rate in % : | 10 |
| + 2 % processing fee | 10200 | 5100 | + 3 % processing fee | 10300 | 20600 | | |
| | | | | | | equal annuity: | 2000 |
| interest rate in % : | 5 | 5 | interest rate in % : | 6 | 6 | (repayment beginning with | |
| debt after year 1: | 10710 | 5355 | debt after year 1: | 10918 | 21836 | the first year of production) | |
| year 2: | 11246 | 5623 | year 2: | 11573 | 23146 | | |
| year 3: | 11808 | 5904 | year 3: | 12267 | 24535 | debt after year 1: | 11000 |
| year 4: | 12398 | 6199 | year 4: | 13004 | 26007 | year 2: | 12100 |
| year 5: | 13018 | 6509 | year 5: | 13784 | 27567 | | |
| | | | year 6: | 14611 | 29221 | remaining debt after | |
| 10 equal annuit. of: | 1194 | 597 | year 7: | 15487 | 30975 | repayment year 1: | 11110 |
| | | | | | | year 2: | 10021 |
| | | | 10 equal annuit. of: | 1504 | 3009 | year 3: | 8823 |
| remaining debt after | | | remaining debt after | | | year 4: | 7505 |
| repayment: year 1: | 12415 | 6207 | repayment: year 1: | 14822 | 29644 | year 5: | 6056 |
| year 2: | 11781 | 5891 | year 2: | 14117 | 28233 | year 6: | 4462 |
| year 3: | 11116 | 5558 | year 3: | 13369 | 26738 | year 7: | 2708 |
| year 4: | 10418 | 5209 | year 4: | 12577 | 25153 | year 8: | 778 |
| year 5: | 9685 | 4842 | year 5: | 11737 | 23473 | | |
| year 6: | 8915 | 4457 | year 6: | 10846 | 21692 | | |
| year 7: | 8106 | 4053 | year 7: | 9902 | 19805 | | |
| year 8: | 7257 | 3629 | year 8: | 8902 | 17804 | | |
| year 9: | 6366 | 3183 | year 9: | 7841 | 15683 | | |
| year 10: | 5430 | 2715 | year 10: | 6717 | 13434 | | |
| year 11: | 4447 | 2224 | year 11: | 5526 | 11051 | | |
| year 12: | 3415 | 1708 | year 12: | 4262 | 8525 | | |
| year 13: | 2332 | 1166 | year 13: | 2924 | 5847 | | |
| year 14: | 1194 | 597 | year 14: | 1504 | 3009 | | |
| year 15: | 0 | 0 | year 15: | 0 | 0 | | |

Repayment Schedule 2, Revised Annuities, Interests and Repayments (in 1000 N)

| Period: | I | Construction | | | | | | Start - up | | | Full capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Annuities:** | I | | | | | | | | | | | | | | | |
| **Loans:** | I | | | | | | | | | | | | | | | |
| local 1st share | I | | | | | | | 1194 | 1194 | 1194 | 1194 | 1194 | 1194 | 1194 | 1194 | 1194..... |
| local 2nd share | I | | | | | | | | 597 | 597 | 597 | 597 | 597 | 597 | 597 | 597..... |
| foreign 1st share | I | | | | | | | | | | 1504 | 1504 | 1504 | 1504 | 1504 | 1504..... |
| foreign 2nd share | I | | | | | | | | | | | 1504 | 1504 | 1504 | 1504 | 1504..... |
| T o t a l | I | 0 | 0 | 0 | 0 | 0 | 0 | 1194 | 1792 | 1792 | 3296 | 4800 | 4800 | 4800 | 4800 | 4800..... |
| | | initial | | | | | | | | | | | | | | |
| Interests: | I | debt: | interest: | | | | | | | | | | | | | |
| Loans: | I | | | | | | | | | | | | | | | |
| local (500) | I | | 60 | | | | | | | | | | | | | |
| local 1st share | I | 13018 | 5 % | | | | | 591 | 561 | 529 | 496 | 461 | 425 | 386 | 346 | 303..... |
| local 2nd share | I | 6509 | 5 % | | | | | | 296 | 281 | 265 | 248 | 231 | 212 | 193 | 173..... |
| foreign 1st share | I | 15487 | 6 % | | | | | | | | 839 | 799 | 757 | 712 | 664 | 614..... |
| foreign 2nd share | I | 15487 | 6 % | | | | | | | | | 839 | 799 | 757 | 712 | 664..... |
| T o t a l | I | | 60 | 0 | 0 | 0 | 0 | 591 | 857 | 810 | 1600 | 2347 | 2211 | 2067 | 1915 | 1754..... |
| | | Local 1st share: | | remaining debt: | | | | 12415 | 11781 | 11116 | 10418 | 9685 | 8915 | 8106 | 7257 | 6366..... |
| | | Local 2nd share: | | remaining debt: | | | | | 6207 | 5891 | 5558 | 5209 | 4842 | 4457 | 4053 | 3629..... |
| | | Foreign 1st share: | | remaining debt: | | | | | | | 14822 | 14117 | 13369 | 12577 | 11737 | 10846..... |
| | | Foreign 2nd share: | | remaining debt: | | | | | | | | 14822 | 14117 | 13369 | 12577 | 11737..... |
| Repayments: | I | | | | | | | | | | | | | | | |
| Loans: | I | | | | | | | | | | | | | | | |
| local (500) | I | | 500 | | | | | | | | | | | | | |
| local 1st share | I | | | | | | | 603 | 633 | 665 | 698 | 733 | 770 | 808 | 849 | 891..... |
| local 2nd share | I | | | | | | | | 302 | 317 | 333 | 349 | 367 | 385 | 404 | 424..... |
| foreign 1st share | I | | | | | | | | | | 665 | 705 | 748 | 792 | 840 | 890..... |
| foreign 2nd share | I | | | | | | | | | | | 665 | 705 | 748 | 792 | 840..... |
| T o t a l | I | 0 | 500 | 0 | 0 | 0 | 0 | 603 | 935 | 982 | 1696 | 2453 | 2590 | 2734 | 2886 | 3046..... |

Schdeule M-12re: Revised Production - cost schedule (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Production factor %: | I | | | | 95 | 95 | 96 | 97 | 98 | 99 | 100 | 100 | 100 |
| 1. Direct materials | I | 1 | 23 | 181 | 766 | 1079 | 1373 | 1648 | 1979 | 2115 | 2212 | 2188 | 2167 |
| 2. Direct manpower | I | 2 | 46 | 621 | 1444 | 1719 | 1959 | 2230 | 2212 | 2558 | 2548 | 2523 | 2486 |
| 3. Factory overheads | I | | | | 128 | 198 | 267 | 332 | 391 | 429 | 469 | 468 | 465 |
| Factory costs | I | 3 | 69 | 802 | 2338 | 2996 | 3599 | 4210 | 4582 | 5102 | 5229 | 5179 | 5118 |
| 4. Administrat.costs | I | 0 | 273 | 620 | 773 | 793 | 817 | 813 | 795 | 794 | 793 | 793 | 793 |
| 5. Trans.,Main.,Sund | I | 1 | 276 | 585 | 655 | 720 | 720 | 740 | 649 | 651 | 652 | 654 | 654 |
| Operating costs | I | 4 | 618 | 2007 | 3766 | 4509 | 5136 | 5763 | 6026 | 6547 | 6674 | 6626 | 6565 |
| 6. Financial costs | I | | 60 | 0 | 0 | 0 | 0 | 591 | 857 | 810 | 1600 | 2347 | 2211 |
| 7. Depreciation | I | 26 | 342 | 1255 | 1339 | 1483 | 1575 | 1719 | 1754 | 1763 | 1743 | 1701 | 1600 |
| Total product. cost | I | 30 | 1020 | 3262 | 5105 | 5992 | 6711 | 8073 | 8637 | 9120 | 10017 | 10674 | 10376 |

Schedule 10-3/2r2: 2nd revision of Calculation of Working Capital (in 1000 N)

| Period: | | | | Construct. Peri | | | Start - up | | | | | | Full capacity | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | X | Y | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| I. Current assets: | | | | | | | | | | | | | | | |
| A. Accounts receiv | 30 | 12 | | 0 | 52 | 167 | 314 | 376 | 428 | 480 | 502 | 546 | 556 | 552 | 547 |
| B. Inventory | | | | | | | | | | | | | | | |
| (a)Materials: | | | | | | | | | | | | | | | |
| Workshop mater. | 60 | 6 | | | 2 | 10 | 24 | 27 | 31 | 33 | 42 | 42 | 41 | 37 | 37 |
| Chemicals (imp.) | 100 | 3.60 | | | | | 16 | 27 | 38 | 48 | 58 | 64 | 70 | 70 | 69 |
| Other materials | 30 | 12 | | | | | 23 | 37 | 50 | 62 | 76 | 84 | 91 | 93 | 93 |
| (b)Spare parts: | 180 | 2 | | | 1 | 13 | 41 | 49 | 66 | 75 | 80 | 82 | 81 | 79 | 69 |
| (c)Work-in-progr | 9 | 40 | | 0 | 2 | 20 | 58 | 75 | 90 | 105 | 115 | 128 | 131 | 129 | 128 |
| (d)Finished prod | 15 | 24 | | 0 | 26 | 84 | 157 | 188 | 214 | 240 | 251 | 273 | 278 | 276 | 274 |
| C. Cash in Hand | 15 | 24 | | 0 | 28 | 80 | 134 | 154 | 170 | 212 | 223 | 238 | 272 | 301 | 294 |
| D. Current assets: | | | | 1 | 110 | 374 | 766 | 933 | 1086 | 1256 | 1346 | 1455 | 1520 | 1537 | 1511 |
| II. Current liabilit | | | | | | | | | | | | | | | |
| A. Accounts payabl | 30 | 12 | | | 1 | 7 | 46 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144 |
| III. Working capital: | | | | | | | | | | | | | | | |
| A. Net working capital | | | | 1 | 109 | 367 | 720 | 867 | 999 | 1150 | 1219 | 1318 | 1373 | 1392 | 1367 |
| B. Increase in working capital | | | | 1 | 108 | 258 | 353 | 146 | 132 | 152 | 68 | 99 | 56 | 19 | -26 |

The cash balance schedule is based on the following calculation:

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IV. Total product.costs | | | | 30 | 1020 | 3262 | 5105 | 5992 | 6711 | 8073 | 8637 | 9120 | 10017 | 10674 | 10376 |
| less: Materials | | | | | 16 | 85 | 552 | 802 | 1052 | 1267 | 1529 | 1649 | 1756 | 1741 | 1729 |
| Depreciation | | | | 26 | 342 | 1255 | 1339 | 1483 | 1575 | 1719 | 1754 | 1763 | 1743 | 1701 | 1600 |
| | 15 | 24 | | 4 | 662 | 1922 | 3214 | 3707 | 4084 | 5087 | 5354 | 5708 | 6518 | 7232 | 7047 |
| V. Required cash balance: | | | | 0 | 28 | 80 | 134 | 154 | 170 | 212 | 223 | 238 | 272 | 301 | 294 |

Schedule 10-6/2r2: 2nd Revision of Total investment costs calculation (in 1000 N)

| Period: | Construction Per | | | Start - up | | | | | | Full capacity | | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 1. Fixed investment: | | | | | | | | | | | | | |
| (a) Initial fixed | 292 | 21162 | 14421 | 2494 | 3459 | 2089 | 3271 | 1455 | 354 | 262 | 621 | 347 | 50227 |
| local | 101 | 9737 | 5520 | 1008 | 1104 | 900 | 1178 | 403 | 91 | 0 | 0 | 0 | 20040 |
| foreign | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 | 30137 |
| (b) Replacements | 0 | 0 | 0 | 3 | 0 | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| local | | | | 3 | | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| foreign | | | | | | | | | | | | | 0 |
| 2. Pre-production: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| local | | | | | | | | | | | | | 0 |
| foreign | | | | | | | | | | | | | 0 |
| 3. Working capital increase: | 1 | 108 | 258 | 353 | 146 | 132 | 152 | 68 | 99 | 56 | 19 | -26 | 1367 |
| local | 1 | 108 | 258 | 353 | 146 | 132 | 152 | 68 | 99 | 56 | 19 | -26 | 1367 |
| foreign | | | | | | | | | | | | | 0 |
| Total investm. costs | 293 | 21270 | 14679 | 2850 | 3605 | 2243 | 3643 | 1914 | 507 | 580 | 1135 | 668 | 53388 |
| local | 102 | 9845 | 5778 | 1364 | 1250 | 1054 | 1549 | 862 | 244 | 318 | 514 | 321 | 23201 |
| foreign | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 | 30187 |

Schedule 10-7/2r2: 2nd Revision of Total assets calculation (in 1000 N)

| Period: | Construction Per. | | | Start - up | | | | | | Full capacity | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | Total |
| 1. Fixed investment: | | | | | | | | | | | | | |
| (a) Initial fixed | 292 | 21162 | 14421 | 2494 | 3459 | 2089 | 3271 | 1455 | 354 | 262 | 621 | 347 | 50227 |
| local | 101 | 9737 | 5520 | 1008 | 1104 | 900 | 1178 | 403 | 91 | 0 | 0 | 0 | 20040 |
| foreign | 191 | 11425 | 8901 | 1487 | 2355 | 1190 | 2094 | 1052 | 263 | 262 | 621 | 347 | 30187 |
| (b) Replacements | 0 | 0 | 0 | 3 | 0 | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| local | | | | 3 | | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 1794 |
| foreign | | | | | | | | | | | | | 0 |
| 2. Pre-production: | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| local | | | | | | | | | | | | | 0 |
| foreign | | | | | | | | | | | | | 0 |
| 3. Current assets increase: | 1 | 109 | 264 | 392 | 167 | 153 | 170 | 90 | 109 | 65 | 18 | -27 | 1511 |
| local | 1 | 108 | 258 | 353 | 146 | 132 | 152 | 68 | 99 | 56 | 19 | -26 | 1367 |
| foreign | | 1 | 6 | 39 | 21 | 21 | 18 | 22 | 10 | 9 | -1 | -1 | 144 |
| Total assets: | 293 | 21271 | 14685 | 2889 | 3626 | 2264 | 3661 | 1936 | 517 | 589 | 1134 | 667 | 53532 |
| local | 102 | 9845 | 5778 | 1364 | 1250 | 1054 | 1549 | 862 | 244 | 318 | 514 | 321 | 23201 |
| foreign | 191 | 11426 | 8907 | 1525 | 2376 | 1210 | 2111 | 1074 | 273 | 271 | 620 | 346 | 30331 |

(30)

Schedule 10-8/3re: Revised Cash-flow table for financial planning (in 1000 N)

| Period: | Construct. Per | | | Start - up | | | | | | Full capacity | | | Salvage value in last year | Total until year twelve: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12... | | |
| Production factor %: | | | | 95 | 95 | 96 | 97 | 98 | 99 | 100 | 100 | 100... | | |
| A. Cash inflow: | | | | | | | | | | | | | | |
| 1.Financial resources | 500 | 24001 | 15007 | 10046 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144... | | 50515 |
| 2.Sales revenue | | | | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254... | | 90393 |
| Total cash inflow: | 500 | 24001 | 15007 | 12252 | 4704 | 7087 | 9407 | 11545 | 12981 | 14520 | 14507 | 14398... | | 140908 |
| B. Cash outflow: | | | | | | | | | | | | | | |
| 1.Total ass.incl.repl | 293 | 21271 | 14685 | 2889 | 3626 | 2264 | 3661 | 1936 | 517 | 589 | 1134 | 667... | -6500 | 53532 |
| 2.Operating costs | 4 | 618 | 2007 | 3766 | 4509 | 5136 | 5763 | 6026 | 6547 | 6674 | 6626 | 6565... | | 54241 |
| 3.Debt service(total) | | | | | | | | | | | | | | |
| (a) Interests: | | | | | | | | | | | | | | |
| Local loan (500) | | 60 | | | | | | | | | | | | |
| Local 1st share | | | | | | | 591 | 561 | 529 | 496 | 461 | 425... | | 3063 |
| Local 2nd share | | | | | | | | 296 | 281 | 265 | 248 | 231... | | 1319 |
| Foreign 1st share | | | | | | | | | | 839 | 799 | 757... | | 2395 |
| Foreign 2nd share | | | | | | | | | | | 839 | 799... | | 1638 |
| (b) Repayments: | | | | | | | | | | | | | | |
| Local loan (500) | | 500 | | | | | | | | | | | | |
| Local 1st share | | | | | | | 603 | 633 | 665 | 698 | 733 | 770... | | 4104 |
| Local 2nd share | | | | | | | | 302 | 317 | 333 | 349 | 367... | | 1667 |
| Foreign 1st share | | | | | | | | | | 665 | 705 | 748... | | 2118 |
| Foreign 2nd share | | | | | | | | | | | 665 | 705... | | 1371 |
| 4.Corporate tax: | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0... | | |
| 5.Dividends on equity | | | | | | | | | 1120 | 1120 | 1120 | 1120... | | 4480 |
| Total cash outflow: | 297 | 22449 | 16692 | 6655 | 8135 | 7400 | 10618 | 9754 | 9976 | 11679 | 13680 | 13153... | -6500 | 130487 |
| C. Surplus/Deficit | 203 | 1552 | -1685 | 5597 | -3431 | -313 | -1211 | 1791 | 3005 | 2841 | 827 | 1245... | 6500 | 10421 |
| D. Cumul. cash balance | 203 | 1755 | 71 | 5667 | 2236 | 1923 | 712 | 2503 | 5508 | 8349 | 9175 | 10421... | | |

Schedule 10-9: Net income statement (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | | Full capacity | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Production factor %: | I | | | | 95 | 95 | 96 | 97 | 98 | 99 | 100 | 100 | 100 |
| Costs: | I | | | | | | | | | | | | |
| 1. Sales | I | | | | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254 |
| 2. Production costs | I | 30 | 1020 | 3262 | 5105 | 5992 | 6711 | 8073 | 8637 | 9120 | 10017 | 10674 | 10376 |
| 3. Gross profit | I | -30 | -1020 | -3262 | -2899 | -1355 | 288 | 1228 | 2781 | 3723 | 4357 | 3687 | 3878 |
| 4. Tax | I | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 5. Net profit | I | -30 | -1020 | -3262 | -2899 | -1355 | 288 | 1228 | 2781 | 3723 | 4357 | 3687 | 3878 |
| 6. Dividends (8 %) | I | | | | | | | | | 1120 | 1120 | 1120 | 1120 |
| 7. Undistrib.profit | I | -30 | -1020 | -3262 | -2899 | -1355 | 288 | 1228 | 2781 | 2603 | 3237 | 2567 | 2758 |
| 8. Accumulated undistributed prof | I | -30 | -1050 | -4312 | -7211 | -8566 | -8278 | -7050 | -4269 | -1665 | 1571 | 4139 | 6897 |
| Ratios: (in %) | | | | | | | | | | | | | |
| Gross profit: sales | I | | | | -131 | -29 | 4 | 13 | 24 | 29 | 30 | 26 | 27 |
| Net profit: sales | I | | | | -131 | -29 | 4 | 13 | 24 | 29 | 30 | 26 | 27 |
| Net profit: equity | I | | | | -21 | -10 | 2 | 9 | 20 | 27 | 31 | 26 | 28 |

Schedule 10-10: Projected balance sheet (in 1000 N)

| Period: | I | Construction Period | | | Start - up | | | | | Full capacity | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| A. Assets (total) | I | 500 | 24001 | 39008 | 49054 | 49121 | 49209 | 48711 | 47904 | 47059 | 47081 | 47340 | 47652 |
| 1.Current assets (total) cumulativ | I I | 204 | 1865 | 444 | 6433 | 3169 | 3009 | 1968 | 3849 | 6963 | 9869 | 10713 | 11931 |
| (a)Cash balance | I | 203 | 1755 | 71 | 5667 | 2236 | 1923 | 712 | 2503 | 5508 | 8349 | 9175 | 10421 |
| (b)Current assets | I | 1 | 110 | 374 | 766 | 933 | 1086 | 1256 | 1346 | 1455 | 1520 | 1537 | 1511 |
| Fixed assets: | I | | | | | | | | | | | | |
| Initial fixed ass. | I | 292 | 21162 | 14421 | 2494 | 3459 | 2089 | 3271 | 1455 | 354 | 262 | 621 | 347 |
| + replacements | I | 0 | 0 | 0 | 3 | 0 | 22 | 220 | 391 | 54 | 262 | 495 | 347 |
| Fixed ass. & repl. | I | 292 | 21162 | 14421 | 2497 | 3459 | 2111 | 3491 | 1846 | 408 | 524 | 1116 | 694 |
| cumulated | I | 292 | 21454 | 35875 | 38372 | 41831 | 43942 | 47433 | 49279 | 49687 | 50211 | 51327 | 52021 |
| depreciation | I | 26 | 342 | 1255 | 1339 | 1483 | 1575 | 1719 | 1754 | 1763 | 1743 | 1701 | 1600 |
| cumul. depreciatio | I | 26 | 368 | 1623 | 2962 | 4445 | 6020 | 7739 | 9493 | 11256 | 12999 | 14700 | 16300 |
| 2.Fixed assets cumu | I | 266 | 21086 | 34252 | 35410 | 37386 | 37922 | 39694 | 39786 | 38431 | 37212 | 36627 | 35721 |
| 3.Losses | I I | -30 | -1050 | -4312 | -7211 | -8566 | -8278 | -7050 | -4269 | -1665 | | | |
| B. Liabilities total | I | 500 | 24001 | 39008 | 49054 | 49121 | 49209 | 48711 | 47904 | 47059 | 47081 | 47340 | 47652 |
| 1.cumulated curr.l. | I | 0 | 1 | 8 | 54 | 121 | 209 | 315 | 442 | 579 | 726 | 871 | 1015 |
| current liability | I I | | 1 | 7 | 46 | 67 | 88 | 106 | 127 | 137 | 146 | 145 | 144 |
| loans: | I | 500 | 10000 | 15000 | 10000 | | | | | | | | |
| cumulated: | I | 500 | 10500 | 25500 | 35500 | 35500 | 35500 | 35500 | 35500 | 35500 | 35500 | 35500 | 35500 |
| repayments | I | 0 | 500 | 0 | 0 | 0 | 0 | 603 | 935 | 982 | 1696 | 2453 | 2590 |
| 2.loans (act.hold.) | I I | 500 | 10000 | 25000 | 35000 | 35000 | 35000 | 34397 | 33462 | 32480 | 30783 | 28330 | 25741 |
| 3.Equity capital | I I | | 14000 | 14000 | 14000 | 14000 | 14000 | 14000 | 14000 | 14000 | 14000 | 14000 | 14000 |
| 4.Reserves | I | | | | | | | | | | 1571 | 4139 | 6897 |

Schedule 10-13: Cash-flow table and calculation of present value for the project under the assumption of no outside financing (in 1000 N)

| Period: | I | Construction Pe | | | Start - up | | | | | | Full capacity | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Production factor %: | I | | | | 95 | 95 | 96 | 97 | 98 | 99 | 100 | 100 | 100 | 100 | 100 |
| Cash inflow: | I | | | | | | | | | | | | | | |
| 1.Sales revenue | I | | | | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254 | 14254 | 14254 |
| A. Cash inflow: | I | 0 | 0 | 0 | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254 | 14254 | 14254 |
| Cash outflow: | I | | | | | | | | | | | | | | |
| 1.Total investment | I | 293 | 21270 | 14679 | 2850 | 3605 | 2243 | 3643 | 1914 | 507 | 580 | 1135 | 668 | 668 | 668 |
| 2.Operating costs | I | 4 | 618 | 2007 | 3766 | 4509 | 5136 | 5763 | 6026 | 6547 | 6674 | 6626 | 6565 | 6565 | 6565 |
| 3.Corporate tax | I | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 1939 |
| B. Cash outflow: | I | 297 | 21888 | 16686 | 6616 | 8114 | 7379 | 9406 | 7940 | 7054 | 7254 | 7761 | 7233 | 9172 | 9172 |
| C.Net cash flow(A-B) | I | -297 | -21888 | -16686 | -4411 | -3477 | -380 | -104 | 3477 | 5789 | 7120 | 6601 | 7020 | 5081 | 5081 |
| E. Cumulative net cash flow | I | -297 | -22185 | -38871 | -43281 | -46759 | -47139 | -47243 | -43765 | -37976 | -30857 | -24256 | -17235 | -12154 | -7073 |

Net Present Value, years 1 to 25:

| | | | |
|---|---|---|---|
| NPV | at | .08 % : | -6642 |
| NPV | at | .07 % : | -2819 |
| NPV | at | .065 % : | -594 |
| NPV | at | .064 % : | -121 |
| NPV | at | .0645 % : | 0 |

| 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28... | Salvage value in last year | Total until year twelve: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100... | | |
| 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254... | | 318452 |
| 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254... | | 318452 |
| 668 | 668 | 668 | 668 | 668 | 668 | 668 | 668 | 668 | 668 | 668 | 668 | 668 | 668... | | 64080 |
| 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565... | 6500 | 165781 |
| 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939... | | 31024 |
| 9172 | 9172 | 9172 | 9172 | 9172 | 9172 | 9172 | 9172 | 9172 | 9172 | 9172 | 9172 | 9172 | 9172... | 6500 | 254385 |
| 5081 | 5081 | 5081 | 5081 | 5081 | 5081 | 5081 | 5081 | 5081 | 5081 | 5081 | 5081 | 5081 | 5081... | | 64067 |
| -1991 | 3090 | 8172 | 13253 | 18334 | 23416 | 28497 | 33579 | 38660 | 43741 | 48823 | 53904 | 58986 | 64067... | | 70567 |

Sensitivity Analysis:

Schedule 10-13: Cash-flow table and calculation of present value for the project under the assumption of no outside financing. Alternative calculation of the Net Present Value of the project under the assumption of an increase af sales revenues of 10 % and of an increase of investment and operating costs of 10 %

| Period: | I | Construction Pe | | | Start - up | | | | | | Full capacity | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Production factor %: | I | | | | 95 | 95 | 96 | 97 | 98 | 99 | 100 | 100 | 100 | 100 | 100 |
| Cash inflow: | I | | | | | | | | | | | | | | |
| 1.Sales revenue | I | 0 | 0 | 0 | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254 | 14254 | 14254 |
| A. Cash inflow: | I | 0 | 0 | 0 | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254 | 14254 | 14254 |
| Cash outflow: | I | | | | | | | | | | | | | | |
| 1.Total investment | I | 322 | 23397 | 16147 | 3135 | 3966 | 2468 | 4007 | 2106 | 558 | 638 | 1248 | 735 | 735 | 735 |
| 2.Operating costs | I | 4 | 680 | 2208 | 4143 | 4960 | 5650 | 6339 | 6629 | 7202 | 7341 | 7289 | 7222 | 7222 | 7222 |
| 3.Corporate tax | I | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1939 | 1939 |
| B. Cash outflow: | I | 326 | 24077 | 18355 | 7278 | 8926 | 8117 | 10346 | 8734 | 7759 | 7979 | 8537 | 7957 | 9896 | 9896 |
| C.Net cash flow(A-B) | I | -326 | -24077 | -18355 | -5072 | -4289 | -1118 | -1045 | 2683 | 5084 | 6394 | 5825 | 6297 | 4358 | 4358 |
| E. Cumulative net cash flow | I | -326 | -24403 | -42758 | -47830 | -52119 | -53237 | -54' | -51598 | -46514 | -40120 | -34295 | -27998 | -23640 | -19282 |

Net Present Value, years 1 to 25:

| | | |
|---|---|---|
| NPV at | .08 % : | -6642 |
| NPV at | .07 % : | -2819 |
| NPV at | .065 % : | -594 |
| NPV at | .064 % : | -121 |
| NPV at | .0645 % : | 0 |

| 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28... | Salvage value in last year | Total until year twelve: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100... | | |
| 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254... | | 318452 |
| 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254... | | 318452 |
| 735 | 735 | 735 | 735 | 735 | 735 | 735 | 735 | 735 | 735 | 735 | 735 | 735 | 735... | | 70488 |
| 7222 | 7222 | 7222 | 7222 | 7222 | 7222 | 7222 | 7222 | 7222 | 7222 | 7222 | 7222 | 7222 | 7222... | 6500 | 181709 |
| 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939... | | 31024 |
| 9896 | 9896 | 9896 | 9896 | 9896 | 9896 | 9896 | 9896 | 9896 | 9896 | 9896 | 9896 | 9896 | 9896... | 6500 | 276721 |
| 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358 | 4358... | | 41731 |
| -14924 | -10566 | -6208 | -1850 | 2508 | 6866 | 11224 | 15582 | 19940 | 24299 | 28657 | 33015 | 37373 | 41731... | | 48231 |

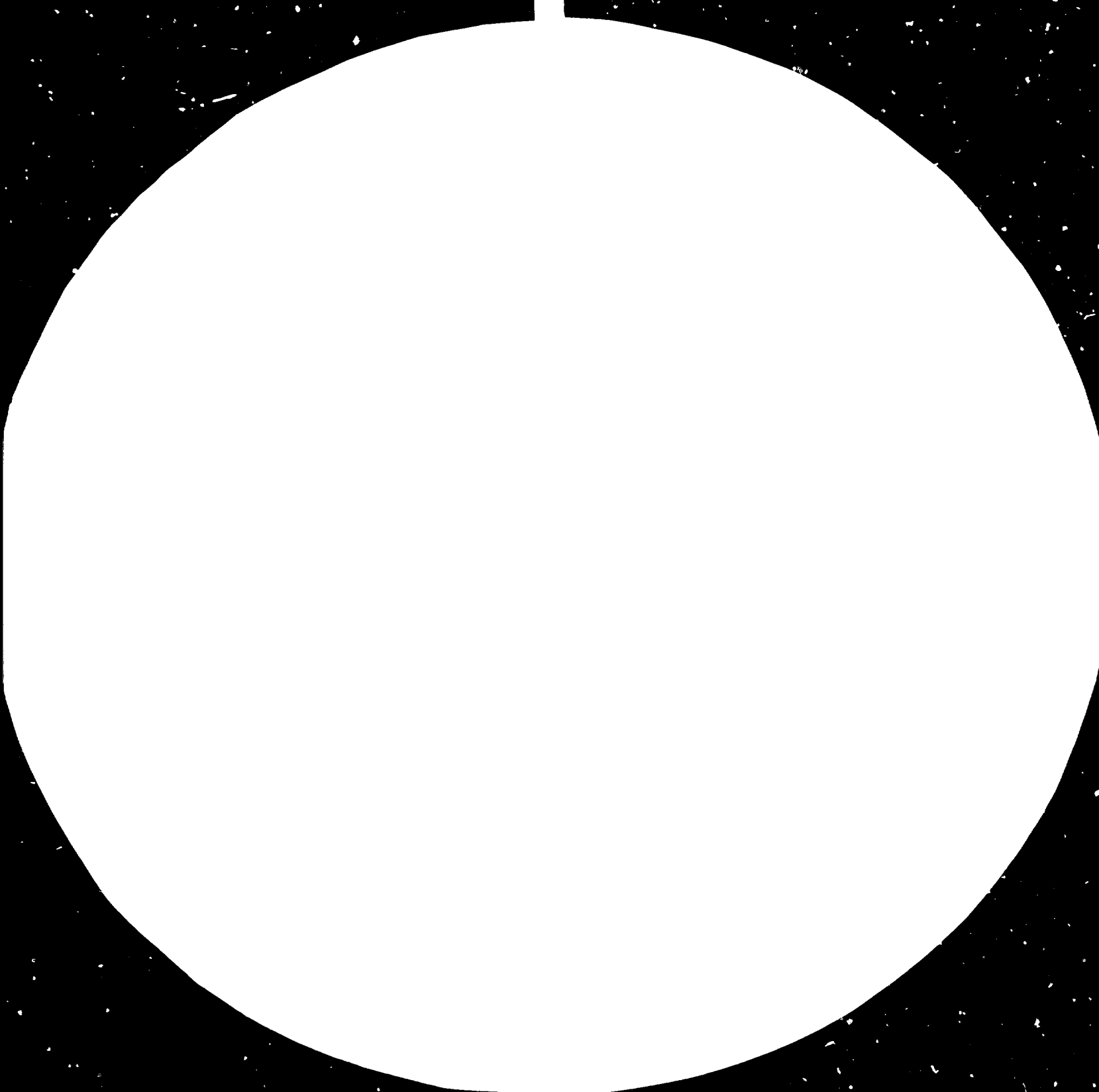
Net Present Value under the assumption ao an increase of sales revenues of 10 % during the whole lifespan of the project:

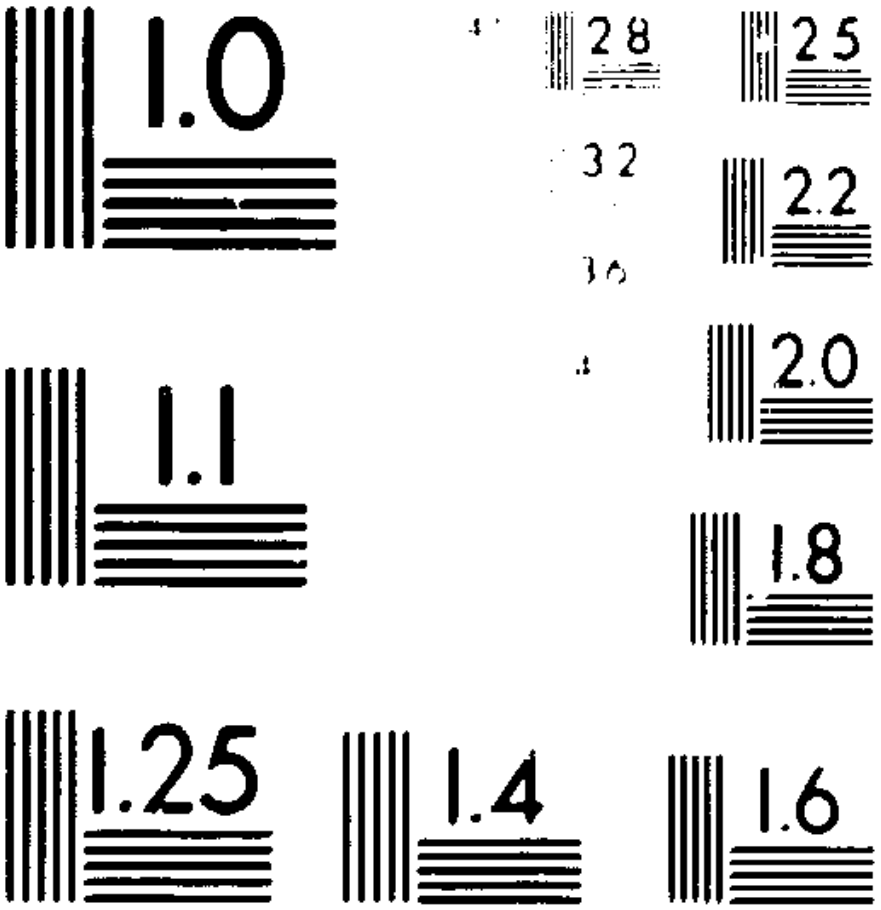
| | |
|---|---|
| NPV at .08 % : | 2639 |
| NPV at .085 % : | 583 |
| NPV at .086 % : | 248 |
| NPV at .0866 % : | 36 |
| NPV at .0867 % : | 0 |

Increase of investment and operating costs of 10 %:

| | |
|---|---|
| NPV at .04 % : | 857 |
| NPV at .041 % : | 226 |
| NPV at .0412 % : | 101 |
| NPV at .0413 % : | 39 |
| NPV at .04136 % : | 2 |


84.04.02
AD. 85.03





Schedule 10-14: Cash-flow table and calculation of present value for the project with outsid financing (in 1000 N)

| Period: | I | Construction Pe | | | Start - up | | | | | Full capacity | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year: | I | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Production factor %: | I | | | | 95 | 95 | 96 | 97 | 98 | 99 | 100 | 100 | 100 | 100 | 100 |
| Cash inflow: | I | | | | | | | | | | | | | | |
| 1.Sales revenue | I | | | | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254 | 14254 | 14254 |
| A. Cash inflow: | I | 0 | 0 | 0 | 2206 | 4637 | 6999 | 9301 | 11418 | 12843 | 14373 | 14362 | 14254 | 14254 | 14254 |
| | I | | | | | | | | | | | | | | |
| Cash outflow: | I | | | | | | | | | | | | | | |
| 1.Total Investment | I | | | | | | | | | | | | | | |
| (a)Equity funds | I | | 14000 | | | | | | | | | | | | |
| (b)Replacements | I | 0 | 0 | 0 | 3 | 0 | 22 | 220 | 391 | 54 | 262 | 495 | 347 | 347 | 347 |
| (c)Repayments and | I | | | | | | | | | | | | | | |
| Interests | I | 0 | 0 | 0 | 0 | 0 | 0 | 1194 | 1792 | 1792 | 3296 | 4800 | 4800 | 4800 | 4800 |
| | I | | | | | | | | | | | | | | |
| 2.Operating costs | I | 4 | 618 | 2007 | 3766 | 4509 | 5136 | 5763 | 6026 | 6547 | 6674 | 6626 | 6565 | 6565 | 6565 |
| | I | | | | | | | | | | | | | | |
| 3.Corporate tax | I | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1939 |
| B. Cash outflow: | I | 4 | 14618 | 2007 | 3769 | 4509 | 5158 | 7177 | 8209 | 8393 | 10232 | 11921 | 11712 | 11712 | 13651 |
| | I | | | | | | | | | | | | | | |
| C.Net cash flow(A-B) | I | -4 | -14618 | -2007 | -1563 | 128 | 1841 | 2124 | 3209 | 4450 | 4141 | 2440 | 2541 | 2541 | 602 |
| | I | | | | | | | | | | | | | | |
| D. Cumulative net | I | -4 | -14622 | -16629 | -18192 | -18064 | -16223 | -14099 | -10890 | -6439 | -2298 | 142 | 2683 | 5225 | 5827 |
| cash flow | I | | | | | | | | | | | | | | |

NPV years 1 to 25:

| | | |
|---|---|---|
| NPV at | .08 % : | -1535 |
| NPV at | .07 % : | -351 |
| NPV at | .0675 % : | -24 |
| NPV at | .0673 % : | 3 |
| NPV at | .06731 % : | 1 |

| 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28... | Salvage value in last year | Total until year twelve: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100... | | |
| 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254... | | 318452 |
| 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254 | 14254... | | 318452 |
| 347 | 347 | 347 | 347 | 347 | 347 | 347 | 347 | 347 | 347 | 347 | 347 | 347 | 347 | 6500 | 7346 |
| 4800 | 4800 | 4800 | 4900 | 4800 | 4800 | 4800 | 3606 | 3009 | 3009 | 1504 | 0 | 0 | 0 | | 72006 |
| 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | 6565 | | 159281 |
| 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | 1939 | | 29085 |
| 13651 | 13651 | 13651 | 13651 | 13651 | 13651 | 13651 | 12457 | 11860 | 11860 | 10355 | 8851 | 8851 | 8851 | 6500 | 281718 |
| 602 | 602 | 602 | 602 | 602 | 602 | 602 | 1797 | 2394 | 2394 | 3898 | 5403 | 5403 | 5403 | | 36734 |
| 6429 | 7031 | 7634 | 8236 | 8838 | 9440 | 10043 | 11839 | 14233 | 16627 | 20526 | 25928 | 31331 | 36734 | | 43234 |