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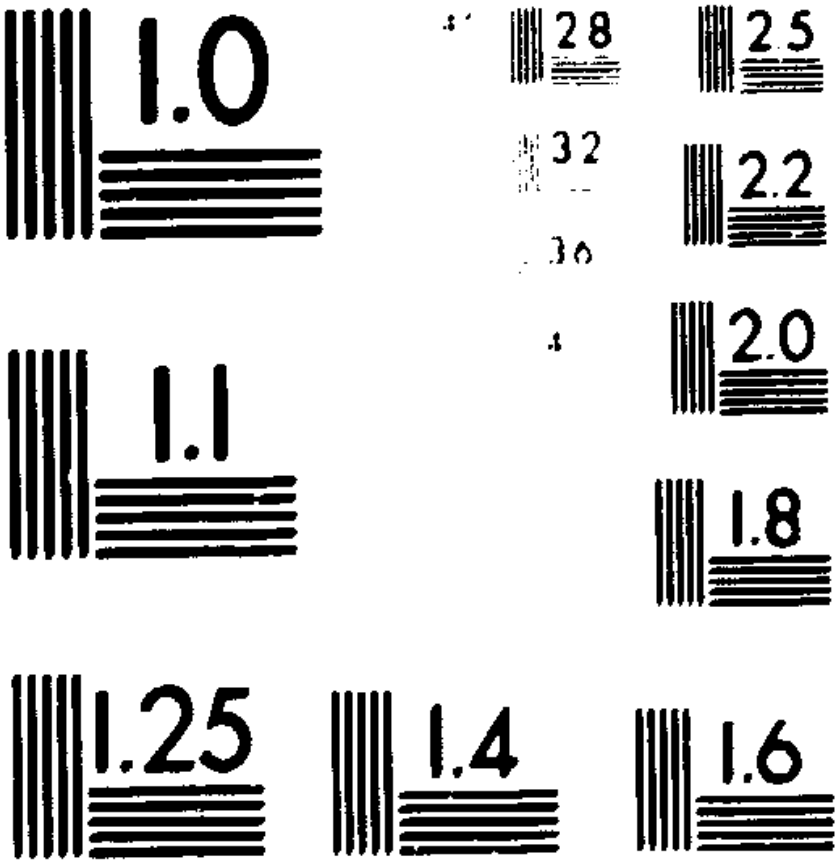


MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS
STANDARD REFERENCE MATERIAL 1010a
(ANSI and ISO TEST CHART No. 2)

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

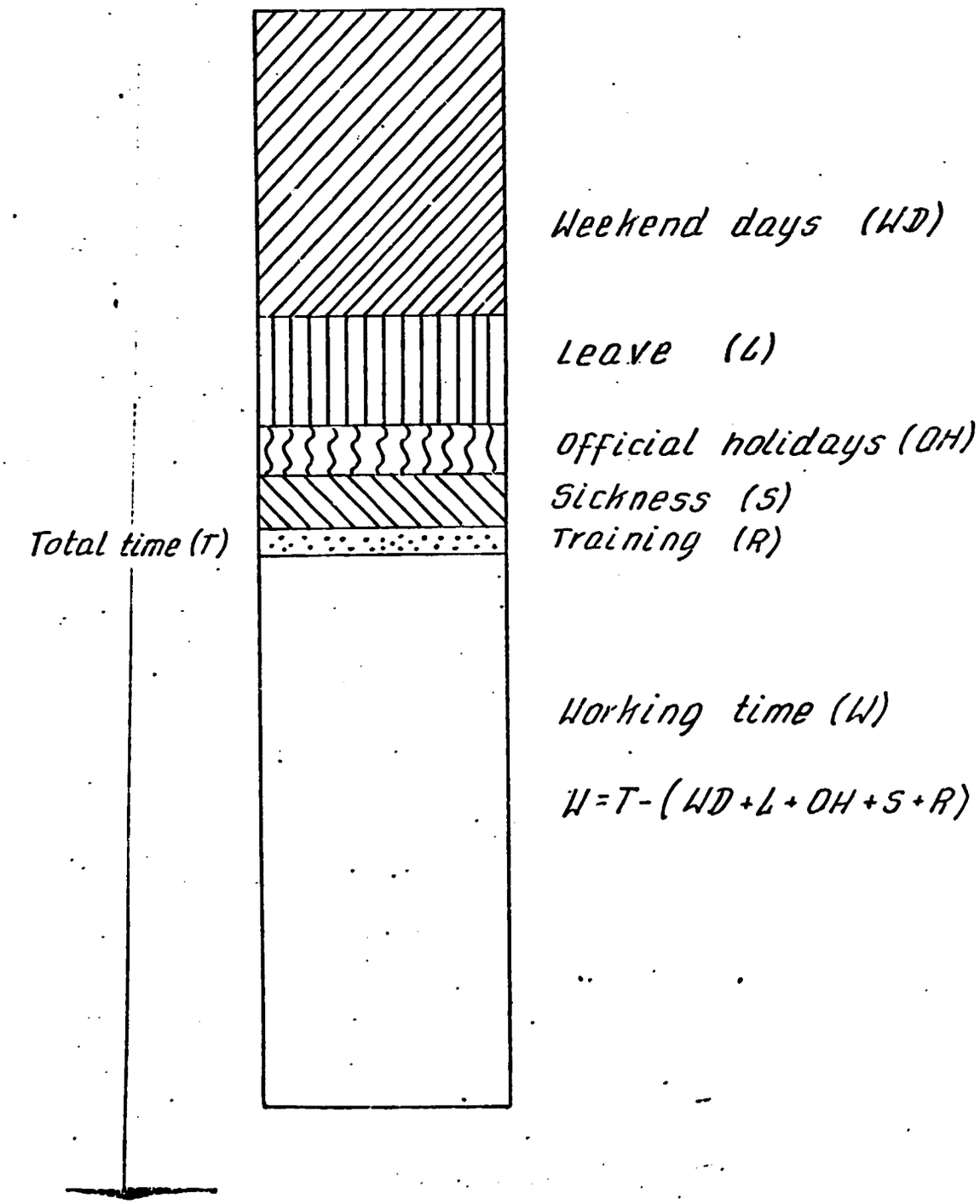
This personnel should be selected from local schools or unemployed educated population. At first the local training theoretical course should be organized with the help of the local and foreing specialist. Afterwards when contracts with suppliers will be concluded, the necessary quantity should be trained 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

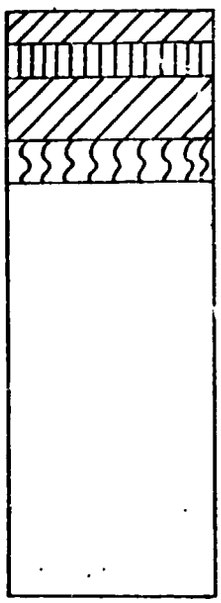
Source of the people should be as above. Employment of this people should start about half a year befote the erection is finished. During this time school classes should be organized where local and foreign specialists should at last during 3-4 months teach people theoratically and practically on the 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
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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
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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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

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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) NUMBER OF SHARES = (Units)
II.	DIVIDENDS PER SHARE :	DIVIDENDS PAID ANNUALLY NUMBER OF SHARES
III.	PRICE-EARNINGS RATIO :	MARKET PRICE OF 1 SHARE EARNINGS PER SHARE
IV.	YIELD : (%)	DIVIDENDS PAID ANNUALLY PER SHARE MARKET PRICE OF 1 SHARE
V.	BOOK VALUE PER SHARE : (usually 'common' stock	SHAREHOLDER'S EQUITY or NET WORTH NUMBER OF SHARES
VI.	DIVIDENT PAYOUT : (%)	TOTAL ANNUAL DIVIDENDS PAID TOTAL NET PROFIT A/TAX
VII.	WORKING ASSETS PER SHARE :	TOTAL ASSETS NUMBER OF SHARES

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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

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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

V83-55906

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

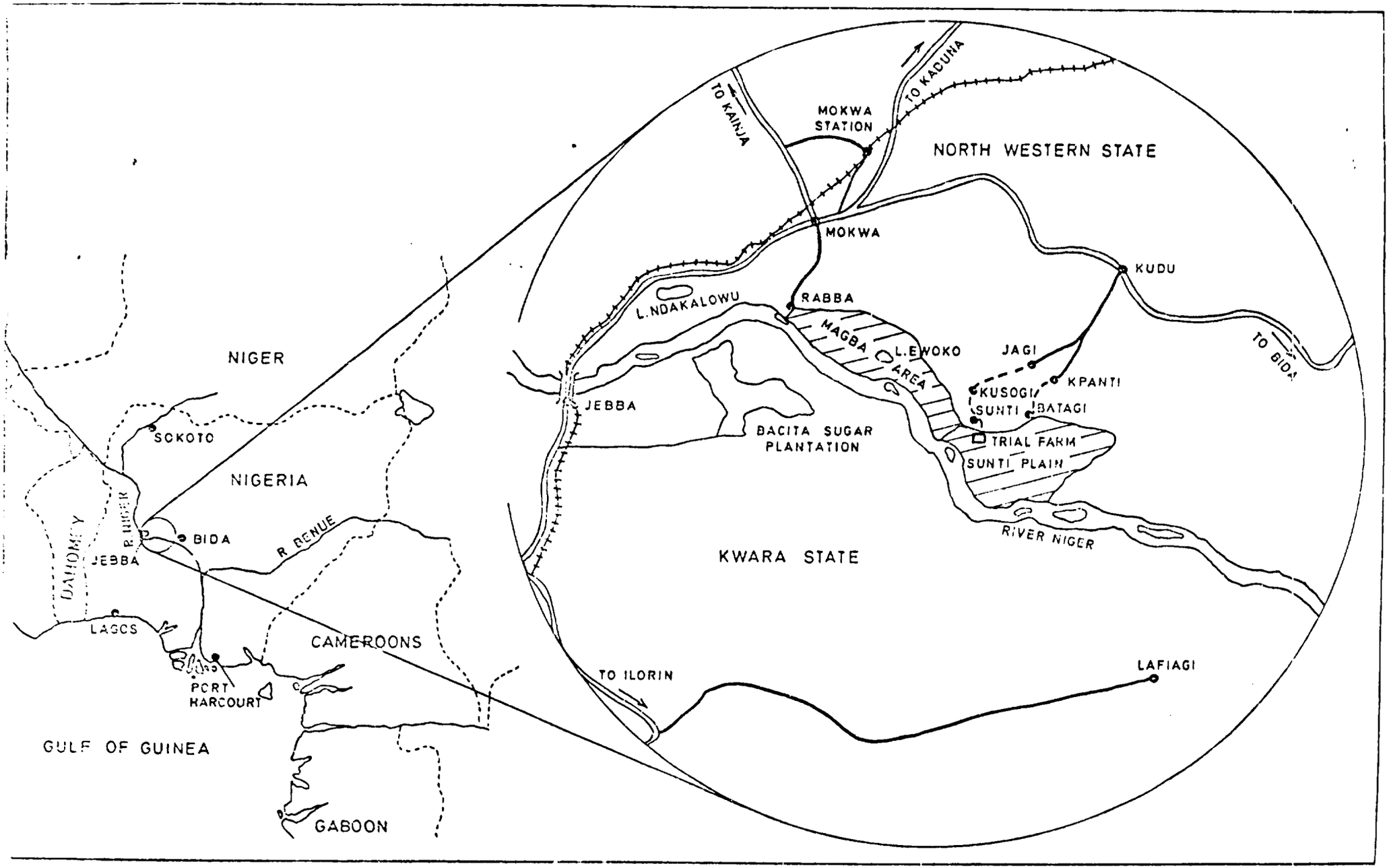
SUNTI SUGAR PROJECT
NORTH WESTERN STATE
REPUBLIC OF NIGERIA

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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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.

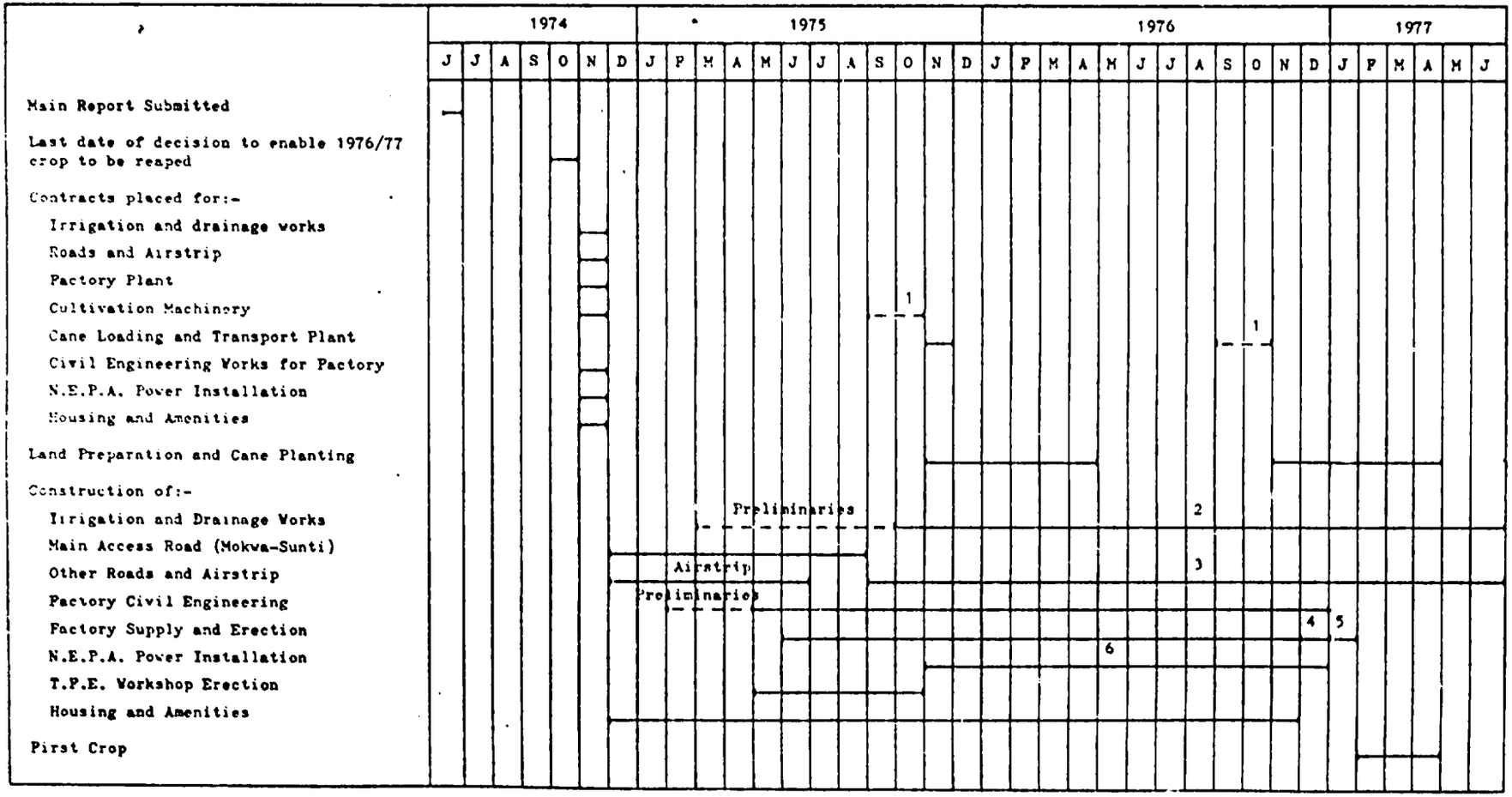
9.2.17 Working Capital: Working capital requirements are shown in Table No. 9.17. The figures for factory and agricultural spares and materials are assessments of the amounts which will be required, bearing in mind the location of and the time required to transport goods to the site. Current liabilities 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 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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